Bare Machine Recovery for CommVault Simpana

User Guide

For Windows

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1 Document Conventions

The following typographical conventions are used throughout this guide:

`/etc/passwd`	represents command-line commands, options, parameters, directory names and filenames
Next >	used to signify clickable buttons on a GUI dialogue
Note:	describes something of importance related to the current topic

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2 Overview

This document describes the essential elements of **Bare Machine Recovery for CommVault Simpana** (**SBMR**) and **Disaster Recovery** based upon a tailored WinPE 5 recovery module. It is based upon version 7.2.1 of the software.

This document describes the steps required to install, configure and use the Bare Machine Recovery for CommVault Simpana (SBMR) product. Refer to the product Readme for installation requirements and late breaking information associated with this release.

2.1 Prerequisites

Note: Please refer to the product Readme for the supported operating systems, RAM and free disk space required. A full list of supported CommVault Simpana clients and servers is included in the Readme.

Ensure that a supported CommVault Simpana backup client is installed on your host system prior to installing SBMR. You should either install this direct or push the latest service pack onto the host from the server.

2.2 Backup Process

SBMR allows you to perform a bare machine recovery of your system direct from a CommVault Simpana backup.

To do this you must first prepare your system using the process outlined below:

Installation (refer to the SBMR Installation and Licensing Guide)

- *Install the SBMR configuration software on the client system to be protected*
- *Create the Trust file*
- *License the software (using a Trial or Full license)*

Configuration

- *Save the configuration parameters.*
- *Install and run the Cristie Recovery ISO Producer (CRISP) tool on a suitable system to create the SBMR WinPE 5 based DR environment. This only needs to be done once.*

Backup system and user data

- *Perform regular standard CommVault Simpana backups as required*

You will then be ready to Restore the system from the Disaster Recovery Backup.

2.3 Recovery Process

In the event of a disaster, having previously taken a CommVault Simpana backup of the system and stored the configuration information, Windows WinPE 5 mode DR enables you to restore your system to the state at the last CommVault Simpana backup.

The SBMR recovery console must be created first by using the Cristie Recovery ISO Producer (CRISP) tool. The output from this tool is a bootable WinPE 5 ISO which can be either burnt to physical CD/DVD media or used directly in a virtual environment.

If your machine supports bootable CD/DVDs, this is the most convenient way to boot the DR module. If the system does not support bootable CD/DVDs, you can boot from the network. Contact Cristie for details on how to set this up.

Windows WinPE 5 offers several advantages, namely:

- *a familiar Windows GUI*
- *the ability to inject new mass storage drivers during the boot process*
- *all variations of Windows dynamic disks are supported (ie. mirrored, spanned, striped and RAID-5)*
- *NTFS volumes/partitions are created natively*
- *support for NTFS mounted folders (junctions) and hard links*
- *the restored backup contains the original file security information*

The WinPE 5 recovery process has six main steps:

1. *Load trust file*
2. *Load Configuration data*
3. *Rebuild storage devices (hard disks)*
4. *Restore OS files from a CommVault Simpana backup*
5. *Dissimilar Hardware and inject new drivers (if necessary)*
6. *Boot into Windows*

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3 Create The Bootable Recovery Environment

The supplied CRISP tool is used to create the SBMR recovery environment. This environment is based upon a customised version of Microsoft's WinPE version 5 (WinPE5).

Once created the recovery environment is booted on the target system and then manages the restore process.

The CRISP tool should be run in conjunction with the supplied CRISP WinPE5 Fileset for SBMR 7.2.1. The fileset should be installed alongside CRISP on the same host.

SBMR requires a specific CommVault Simpana client to be added during the creation of the SBMR recovery environment ISO. You will need to specify or browse to a folder containing the appropriate CommVault Simpana 64-bit (WinPE5) client installation MSIEXEC file (with file extension .MSI). An example of this is BaseClient.msi. **This is important; it will not be possible to create the recovery ISO without this CommVault Simpana client installation file.**

> ***Note: Always use a 64-bit (x64) version for WinPE5 based builds.***

You will need to create separate ISOs for each CommVault Simpana client used. Use an ISO version that corresponds to the client version used for the backup. So, for example, use an ISO created with the CommVault Simpana client version Simpana 9.0 SP6 and 10.0 SP2a to match backups made with that version.

A full discussion of how to install and run CRISP is contained in the separate **CRISP User Guide**. Note that the CRISP does not need to be installed on the system to be backed up; any suitable host machine will do.

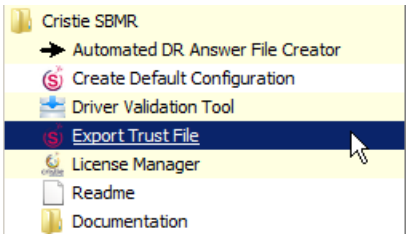
Output from the CRISP tool is a bootable WinPE 5 ISO file which can then be burnt to physical media (CD or DVD) or mounted directly in a VM environment. This media is then booted on the target machine to manage the recovery operation.

4 Export the Trust file

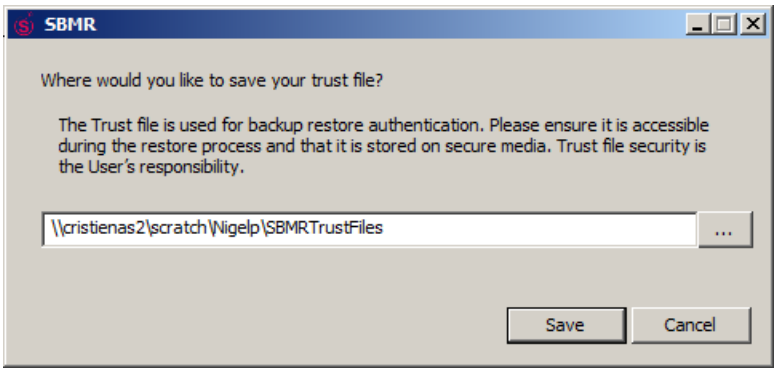
During installation you will be prompted for a location that will be used to hold the **Trust** file. This secure encrypted file contains credentials that will be used later on during the restore process to establish a secure connection with the CommVault Simpana server.

You can skip the installation Trust file location dialogue if you wish as long as you manually run this step again prior to creating a backup. To do this select **Export Trust File** after SBMR is installed as below.

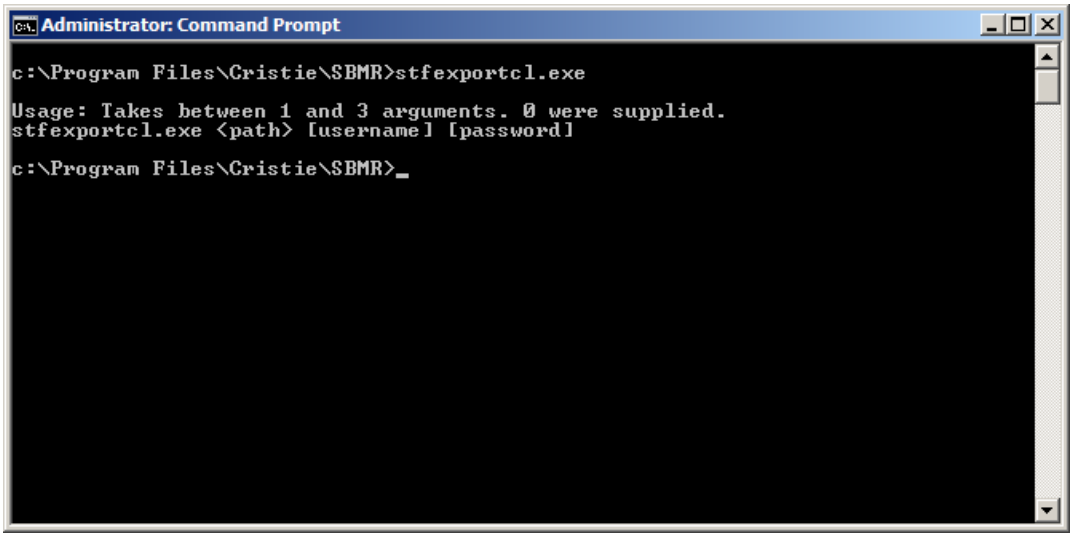
.



You will then be prompted for a suitable location:


SBMR
Where would you like to save your trust file?
The Trust file is used for backup restore authentication. Please ensure it is accessible during the restore process and that it is stored on secure media. Trust file security is the User's responsibility.
\\cristienas2\scratch\Nigelp\SBMRTrustFiles
...
Save
Cancel

You may also use the command-line version of Trust file save feature which is useful when scripting. This program is called **StfExportCl.exe** and is installed in the SBMR installation folder. So for example:


Administrator: Command Prompt
c:\Program Files\Cristie\SBMR>stfexportcl.exe
Usage: Takes between 1 and 3 arguments. 0 were supplied.
stfexportcl.exe <path> [username] [password]
c:\Program Files\Cristie\SBMR>

The 3 parameters to the command are:

path: UNC path to the Trust file location

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username/**password**: network path access credentials (only required for network paths)

For example:

```
stfexportcl.exe \\galaxy\public\test stroud\test cristie
```

or

```
stfexportcl.exe F:\TrustFile
```

where F:\ is assigned to a local USB disk

> ***Note: The Trust file must be accessible during the restore process. So it is suggested that the file is held on a network share or removable media (such as a USB disk say). Do not save the file to the local system since this will not be available during the disaster recovery process. Also note Trust file security is the User's responsibility.***

5 The SBMR Create Configuration Tool

Configuration information is saved by default to the **SBMRCFG** folder on the Windows system partition. This cannot be changed.

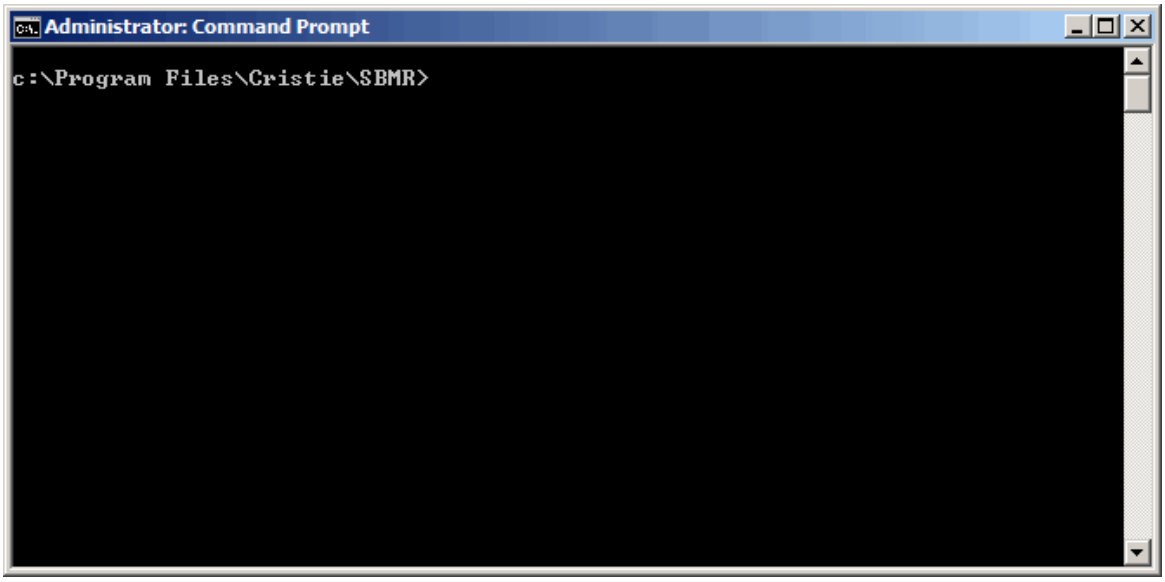
The Cristie tool that provides this function is called **SBMRCfg.exe** which is located in the SBMR installation folder (normally **Program Files\Cristie\SBMR**). This is a command line only tool which is licensed for use for a 30 initial day trial period. A full license is required to use the program beyond the trial period.

As part of this process, details about the hard disks, operating system, storage controller(s), network adapter(s) and network settings will be queried and stored. You can override some of these details if you wish.

The next sections discuss this process in more detail.

5.1 Creating the Configuration Information

To create the configuration manually, run a command window and navigate to the folder where SBMR is installed. For example:



The SBMR configuration program is called **SBMRCfg.exe**. Enter the command `SBMRCfg.exe /?` This will display the command line options available.

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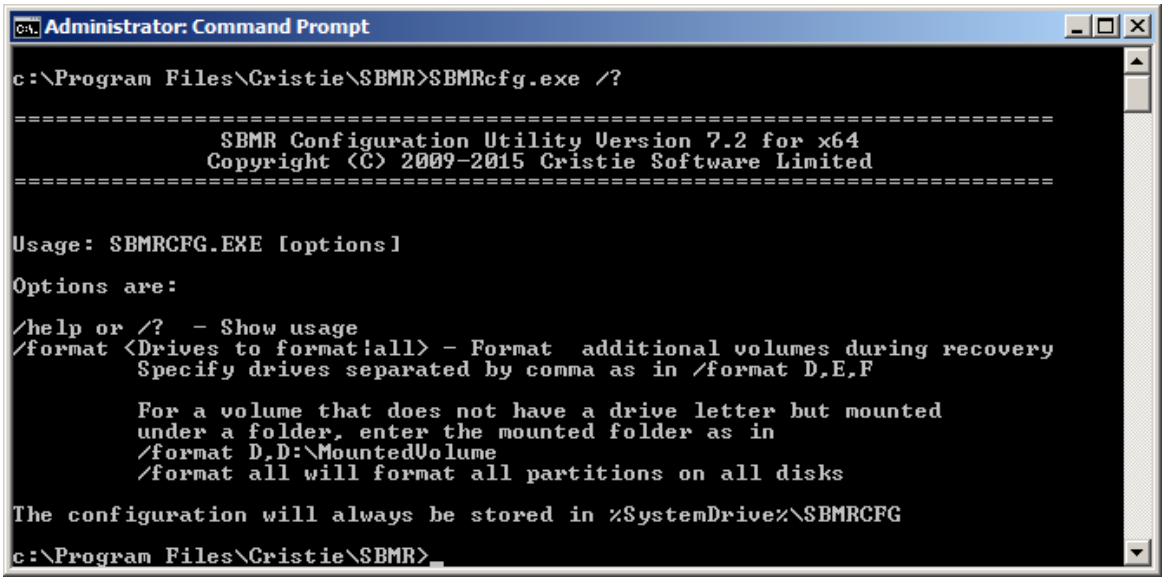

Administrator: Command Prompt
c:\Program Files\Cristie\SBMR>SBMRcfg.exe /?
SBMR Configuration Utility Version 7.2 for x64
Copyright (C) 2009-2015 Cristie Software Limited
Usage: SBMRCFG.EXE [options]
Options are:
/help or /? - Show usage
/format <Drives to format|all> - Format additional volumes during recovery
Specify drives separated by comma as in /format D,E,F
For a volume that does not have a drive letter but mounted
under a folder, enter the mounted folder as in
/format D,D:\MountedVolume
/format all will format all partitions on all disks
The configuration will always be stored in %SystemDrive%\SBMRCFG
c:\Program Files\Cristie\SBMR>

The command line options are very simple:

/help or **/?**

shows **SBMRCfg** usage. This displays the command option summary.

/format <Drives to format | all>

The /format option allows disk volumes other than the Windows drive to be formatted during the recovery. By default, only the Windows volume will be formatted. There is an exception to this if Windows is not contained within the first partition of the disk. In that case, both the Boot partition and the Windows partition will be configured for formatting. However, regardless of this setting, the WinPE 5 based recovery environment will allow any or all partitions to be formatted.

So, for example, if volumes D:, E: and F: are to be additionally formatted during recovery, enter:

`SBMRCfg.exe /format D,E,F` (separate the drive letters using a comma)

Enter the following to back up all partitions on all drives on the system:

```
SBMRCfg.exe /format all
```

Volumes mounted on local folders not having a drive letter can be specified like this:

`SBMRCfg.exe /format D:\MountedVolume`

where `D:\MountedVolume` is the folder mount point. An example using both normal partitions and a mounted volume is:

`SBMRCfg.exe /format D,D:\MountedVolume`

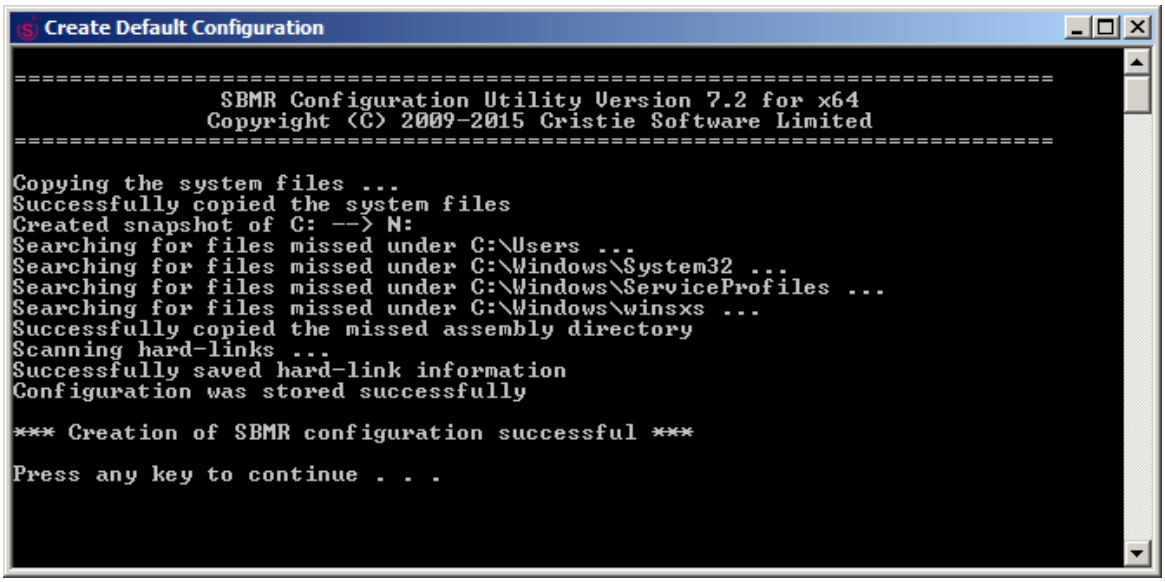
SBMRCfg stores the configuration in `%SystemDrive%\SBMRCFG folder` (`%SystemDrive%` is the drive associated with the Windows folder, usually `C:\`). This location cannot be changed.

> ***Note: it is important to remember that the SBMR configuration must be created before the CommVault Simpana Client backup is made. Cristie suggests that this is done by creating a job to run on the CommVault Simpana Scheduler containing a script that calls the SBMRCfg.exe program installed in the SBMR installation folder. On host systems with many disk volumes and large numbers of files this could take a significant amount of time to run; perhaps an hour or more.***

5.2 Backup of Boot and SystemState Files

On all Windows OS's, files additional to the standard CommVault Simpana backup dataset must be copied and saved. These include boot files and SystemState objects which are not normally backed up by the CommVault Simpana Client on these OS's.

Some of the additional files backed up are also locked at the time of backup and must be backed up using the Windows Open File Manager **VSS**. So when SBMRCfg runs, it invokes VSS to take a snapshot copy of these extra files:


Create Default Configuration
SBMR Configuration Utility Version 7.2 for x64
Copyright (C) 2009-2015 Cristie Software Limited
Copying the system files ...
Successfully copied the system files
Created snapshot of C: --> N:
Searching for files missed under C:\Users ...
Searching for files missed under C:\Windows\System32 ...
Searching for files missed under C:\Windows\ServiceProfiles ...
Searching for files missed under C:\Windows\winsxs ...
Successfully copied the missed assembly directory
Scanning hard-links ...
Successfully saved hard-link information
Configuration was stored successfully
*** Creation of SBMR configuration successful ***
Press any key to continue . . .

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6 Using a CommVault Simpana Backup for Disaster Recovery

SBMR allows a previously created CommVault Simpana backup to be used as a DR backup.

As long as the SBMR configuration has been created (see previous section) and a CommVault Simpana backup is performed afterwards, then it will be possible to recover the system using the DR environment.

> ***Note: this document does not describe how to create CommVault Simpana backups. Please refer to your CommVault Simpana Administrator's Guide for details.***

7 Restoring your System

This section discusses the steps required to run a recover sequence using the SBMR Recovery Environment. The console is booted from the media created by CRISP in conjunction with the CRISP WinPE5 Fileset for SBMR 7.2.1 (see Create the bootable cloning environment for further details).

The WinPE 5 based recovery environment is booted on the ***target*** system. This could be the original or a dissimilar system.

A typical SBMR recovery sequence consists of the following steps.

1. *Install and run the **Cristie Recovery ISO Producer** (**CRISP**) tool on a suitable system to create the SBMR WinPE 5 based recovery environment. This only needs to be done once.*
2. *Boot the SBMR WinPE 5 recovery environment on the **target** system.*
3. *Run a restore sequence from the recovery environment on the **target** system using the CommVault Simpana backup.*
4. *When the restore operation is complete and, before booting the system, you may change the hostname and IP address as required. If the target system uses different hardware from the source system inject additional drivers into the system using the hardware wizard tool. This tool will detect any new devices in the target system and prompt for the drivers.*
5. *Boot the recovered system.*

7.1 Booting the WinPE 5 DR Environment from CD

Insert the bootable SBMR WinPE 5 DR CD/DVD-ROM and reboot the machine. You will be prompted to **Press any key to boot from the CD or DVD**.

This prompt is only made for a few seconds before the system will attempt to boot the underlying OS, so you will need to react quickly.

> ***Note: It is possible to suppress this prompt completely during the ISO creation stage. If the prompt is disabled then the DR ISO image will always booted by default. Please refer to CRISP documentation which describes how to do this.***

To support devices (for example a new mass storage controller) not supported in the current DR environment, WinPE 5 allows drivers for any device to be injected at any time *post boot*. Refer to the section titled Load a Driver for information on how to do this. Ensure you add the correct driver version; 64-bit for WinPE5.

7.2 WinPE 5 Based SBMR Recovery Environment

When the **WinPE 5 SBMR Recovery Environment** is booted, a Windows installation-like boot procedure is started.

During the boot process, WinPE 5 drivers for your **Plug and Play** devices will be loaded - in particular the **Mass Storage** devices and **Network Adapters**.

When the WinPE 5 system has fully booted, it is possible to remove the CD/DVD if you wish.

> ***Note: the DR Console will automatically reboot 72 hours after starting. This is an operating limitation of the Microsoft Windows WinPE 5 environment.***

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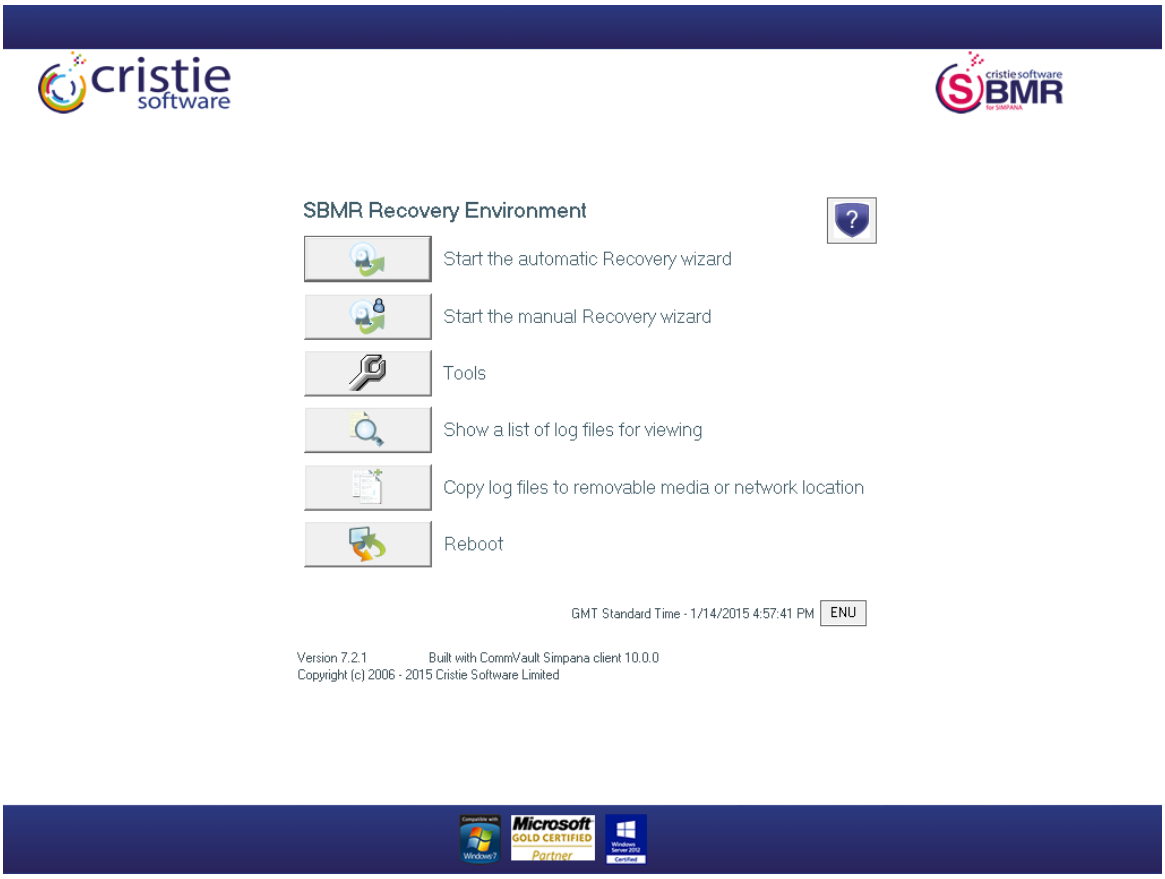
When this sequence completes, the **SBMR Recovery Console** will be shown.

7.2.1 SBMR Recovery Environment Main Menu

When you boot the **WinPE 5** DR environment (the WinPE2 and WinPE5 versions are very similar), you will see the **SBMR Recovery Environment** Main Menu as below:


cristie software
cristie software SBMR
SBMR Recovery Environment
Start the automatic Recovery wizard
Start the manual Recovery wizard
Tools
Show a list of log files for viewing
Copy log files to removable media or network location
Reboot
GMT Standard Time - 1/14/2015 4:57:41 PM
ENU
Version 7.2.1
Built with CommVault Simpana client 10.0.0
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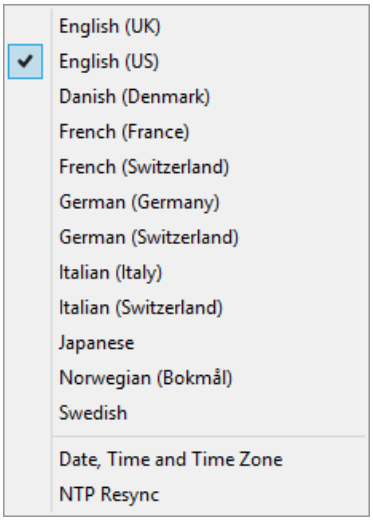
You may configure the format of the displayed date/time and the keyboard layout, by pressing the locale ENU icon. Note this icon will be shown according to the locale of the host system used to create the ISO using the CRISP utility so it may not match the version shown here. So if, for example, the ISO was built on a machine configured with a UK locale it will be displayed as ENG.



By default the standard display uses a keyboard layout to match the default locale as discussed above. However, this may be changed to one of the listed alternatives. Note that this does not change the display language which is always English.

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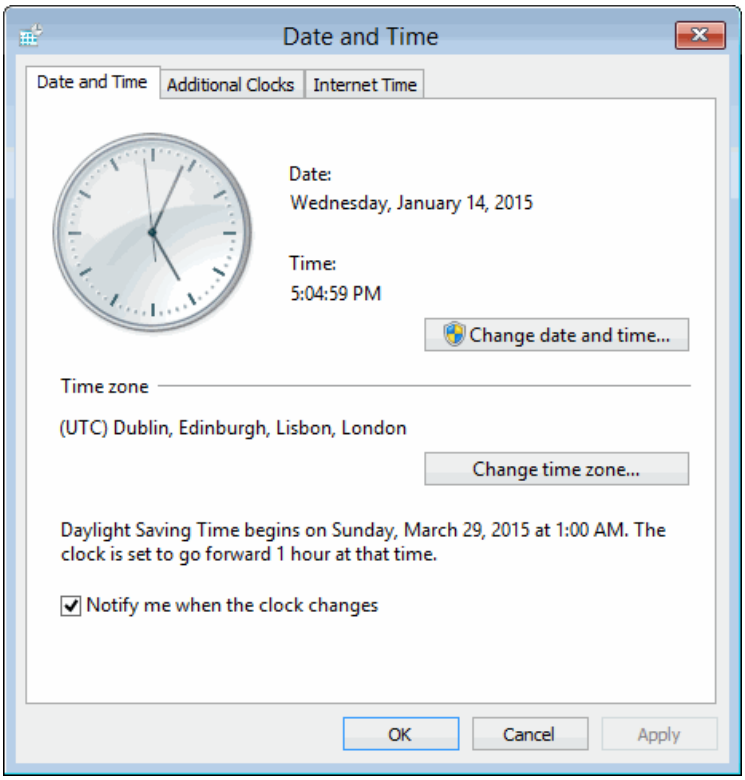
Select **Date, Time and Time Zone** to configure the time zone for the recovery.

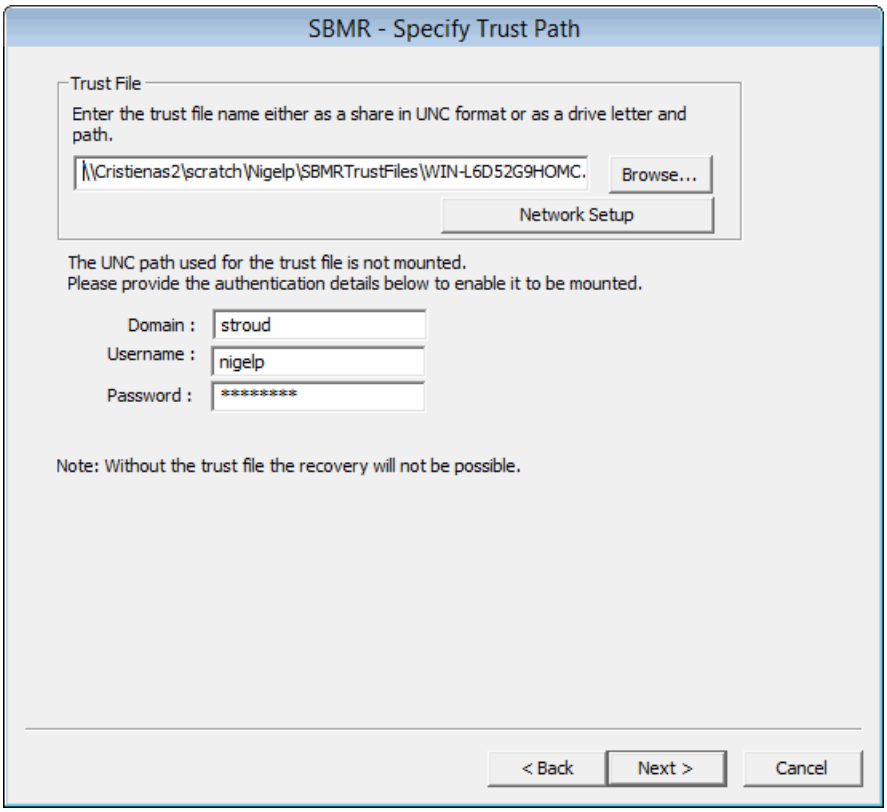


Note: the Additional Clocks and Internet Time tabs are operational. In fact it is possible to synchronise the system time with an NTP time server if required.

Select the Help button to show online help for the recovery environment.

7.2.2 Start the automatic Recovery wizard

Select the **Start the Automatic Recovery wizard** option to commence an automatic DR sequence.


SBMR - Specify Trust Path
Trust File
Enter the trust file name either as a share in UNC format or as a drive letter and path.
\\Cristienas2\scratch\Nigelp\SBMRTrustFiles\WIN-L6D52G9HOMC.
Browse...
Network Setup
The UNC path used for the trust file is not mounted.
Please provide the authentication details below to enable it to be mounted.
Domain : stroud
Username : nigelp
Password : ********
Note: Without the trust file the recovery will not be possible.
< Back
Next >
Cancel

First you must specify the location of your **Trust** file. This was created during the install of SBMR on the original host system. This may reside on a network share or a USB disk. The example shows a UNC path so the access credentials must also be specified. Enter a valid path and press Next> to load the Trust file and continue.

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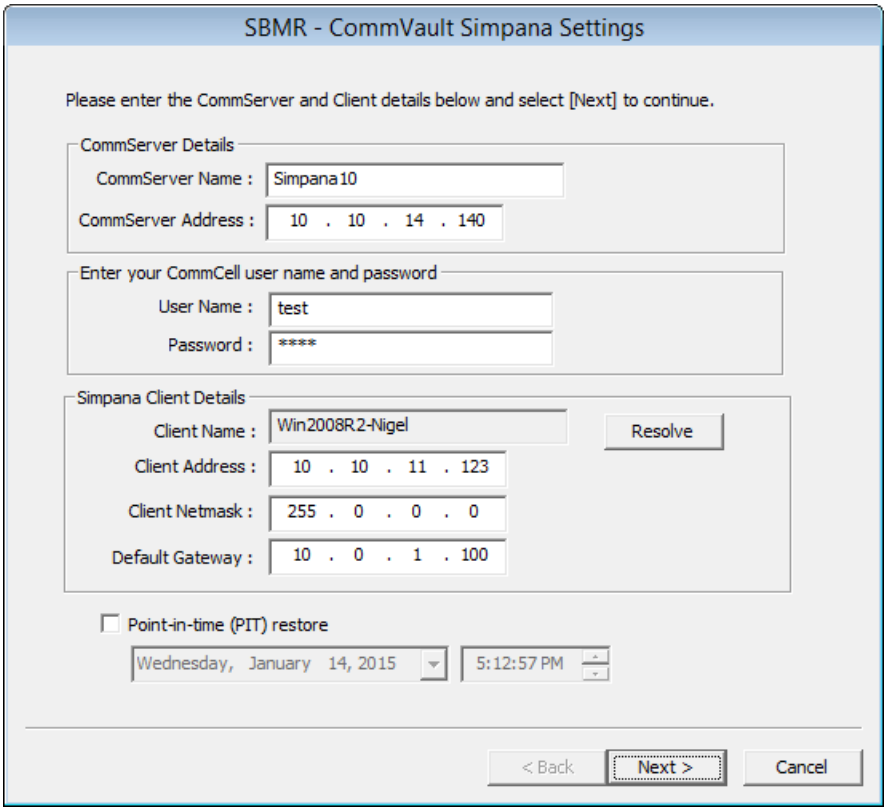
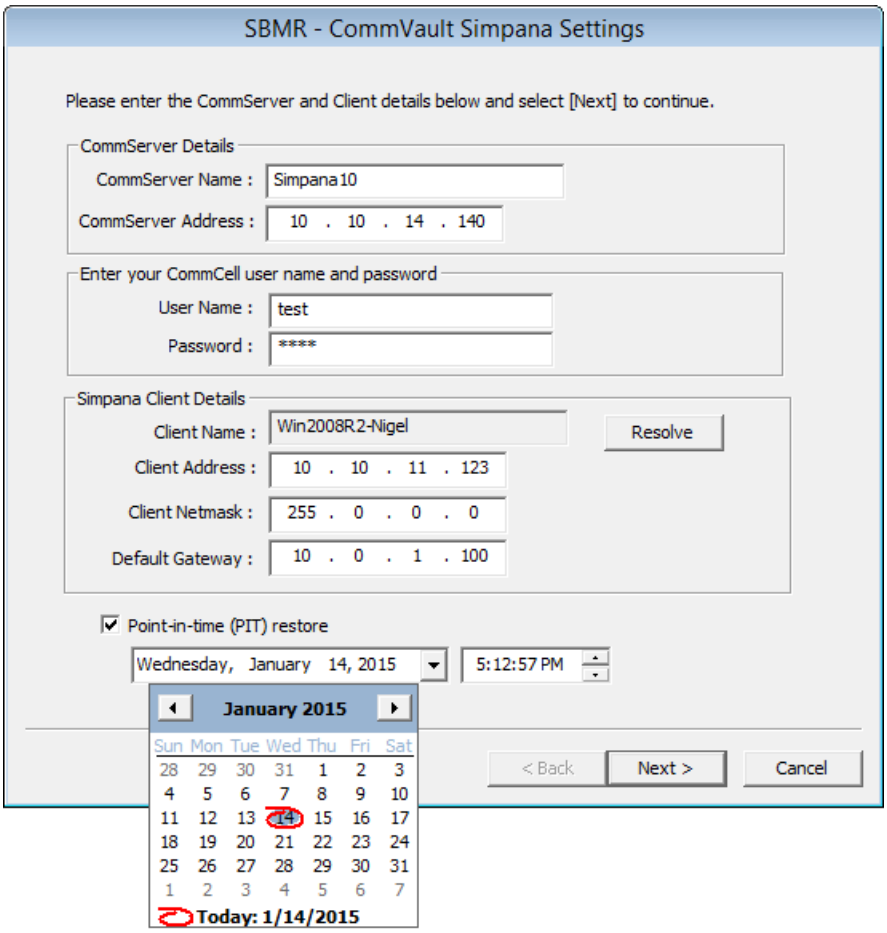
7.2.2.1 Specify Client/Server and Recovery Date/Time

The first step of the automatic recovery identifies the location of the **CommVault Simpana Server** and **Client** used to back up the host system.



> ***Note: The supplied Client address must be the original source system's IP address. If you wish to clone to a new IP address use the option provided in the section Clone Settings.***

Selecting the **Point-in-time** (PIT) restore mode will allow the system to be recovered from the most recent backup before the specified date and time. This means the version of any file restored will be earlier than the specified date and time. Selecting the down-arrow in the calendar control will bring up a calendar:


SBMR - CommVault Simpana Settings
Please enter the CommServer and Client details below and select [Next] to continue.
CommServer Details
CommServer Name : Simpana10
CommServer Address : 10 . 10 . 14 . 140
Enter your CommCell user name and password
User Name : test
Password : ****
Simpana Client Details
Client Name : Win2008R2-Nigel
Resolve
Client Address : 10 . 10 . 11 . 123
Client Netmask : 255 . 0 . 0 . 0
Default Gateway : 10 . 0 . 1 . 100
Point-in-time (PIT) restore
Wednesday, January 14, 2015
5:12:57 PM
January 2015
Sun Mon Tue Wed Thu Fri Sat
28 29 30 31 1 2 3
4 5 6 7 8 9 10
11 12 13 14 15 16 17
18 19 20 21 22 23 24
25 26 27 28 29 30 31
1 2 3 4 5 6 7
Today: 1/14/2015
< Back
Next >
Cancel

This can be used to scroll the months/years backwards and forwards as necessary.

> ***Note: a future date will result in the latest backup being recovered.***

If PIT mode is not selected then, by default, the latest file versions will be restored.

Select Next> to continue. At this point the client backup on the specified server will be accessed and the machine configuration extracted.

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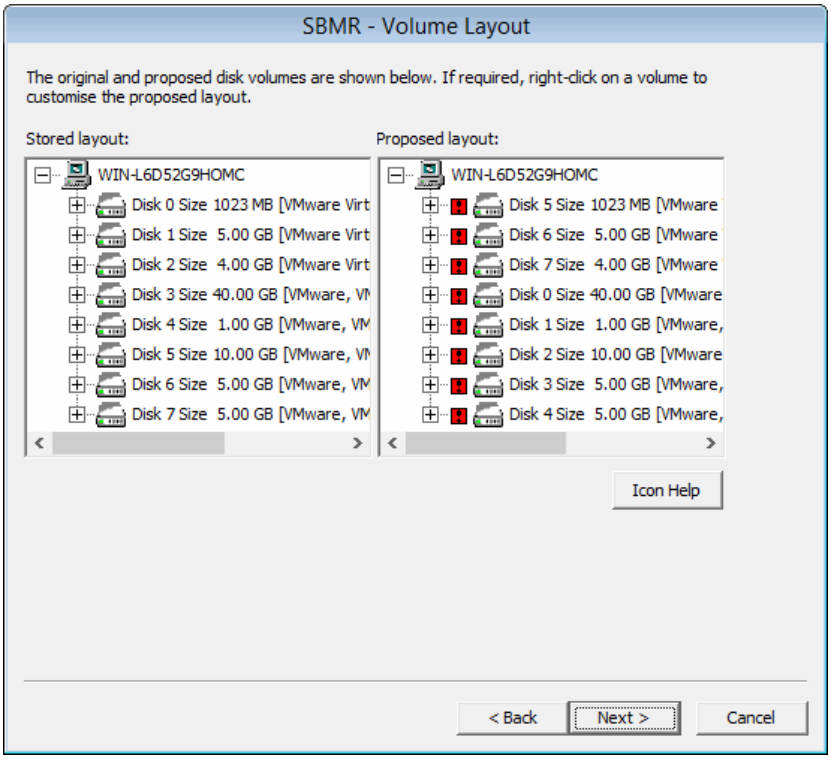
7.2.2.2 Confirm Volume Layout

The next step in the **Automatic recovery** shows a list of the disks and partitions to be recovered.


SBMR - Volume Layout
The original and proposed disk volumes are shown below. If required, right-click on a volume to customise the proposed layout.
Stored layout:
WIN-L6D52G9HOMC
Disk 0 Size 1023 MB [VMware Virt
Disk 1 Size 5.00 GB [VMware Virt
Disk 2 Size 4.00 GB [VMware Virt
Disk 3 Size 40.00 GB [VMware, VM
Disk 4 Size 1.00 GB [VMware, VM
Disk 5 Size 10.00 GB [VMware, VM
Disk 6 Size 5.00 GB [VMware, VM
Disk 7 Size 5.00 GB [VMware, VM
Proposed layout:
WIN-L6D52G9HOMC
Disk 5 Size 1023 MB [VMware
Disk 6 Size 5.00 GB [VMware
Disk 7 Size 4.00 GB [VMware
Disk 0 Size 40.00 GB [VMware
Disk 1 Size 1.00 GB [VMware,
Disk 2 Size 10.00 GB [VMware
Disk 3 Size 5.00 GB [VMware,
Disk 4 Size 5.00 GB [VMware,
Icon Help
< Back
Next >
Cancel

The left-hand panel of the dialogue shows the original disk layout and partitions. The right-hand panel shows how the recovered disks will be partitioned after the recovery.

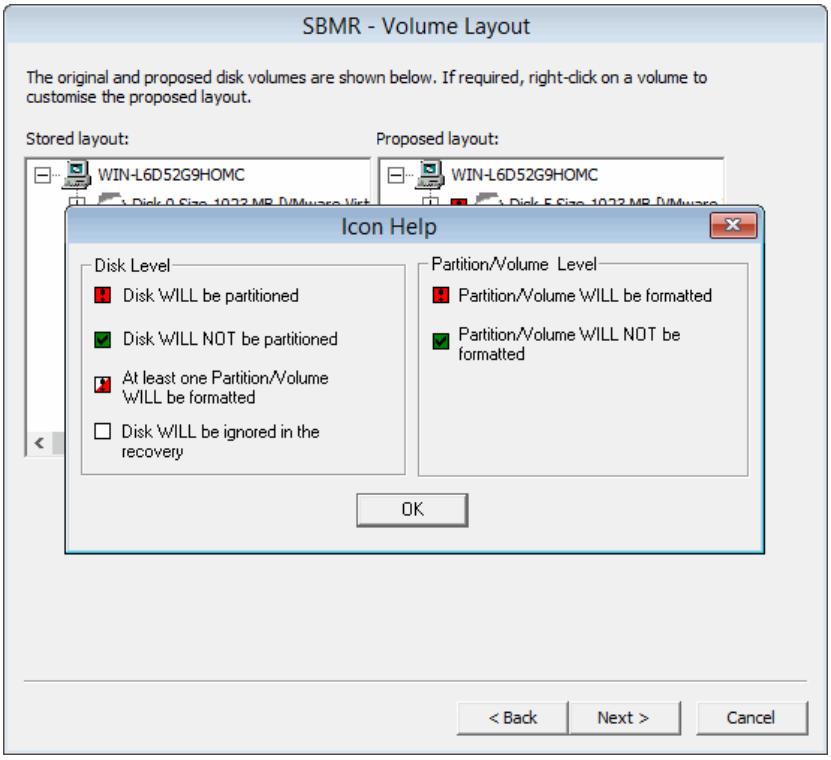
A green tick box ✔ next to a disk signifies that the disk and its underlying partitions will be left intact. Placed next to a partition/volume means that the corresponding partition/volume **WILL NOT** be partitioned.

A red exclamation mark ❗ placed next to a disk means it **WILL** be partitioned during recovery. Placed next to a partition or volume means that the corresponding partition/volume **WILL** be partitioned.

A red/white exclamation mark ❗ placed next to a disk means at least one partition/volume **WILL** be partitioned.

A white box ☐ indicates that the disk will be completely ignored during the recovery.

Click on the Icon Help button to display a summary of this:


SBMR - Volume Layout
The original and proposed disk volumes are shown below. If required, right-click on a volume to customise the proposed layout.
Stored layout:
Proposed layout:
WIN-L6D52G9HOMC
WIN-L6D52G9HOMC
Icon Help
Disk Level
Disk WILL be partitioned
Disk WILL NOT be partitioned
At least one Partition/Volume WILL be formatted
Disk WILL be ignored in the recovery
Partition/Volume Level
Partition/Volume WILL be formatted
Partition/Volume WILL NOT be formatted
OK
< Back
Next >
Cancel

When the recovery is to the original system, the contents of both panels will look similar if the number of disks is the same. Possibly the disk sizes will be different.

When performing a recovery to a dissimilar system, the disk mapping can be much more complex. Some of the criteria used to judge the disk mapping are:

- disk geometry
- disk capacity
- if currently formatted, the disk signature

You may right-click on any disk shown in the right-hand panel to select whether the disk will be partitioned or not.

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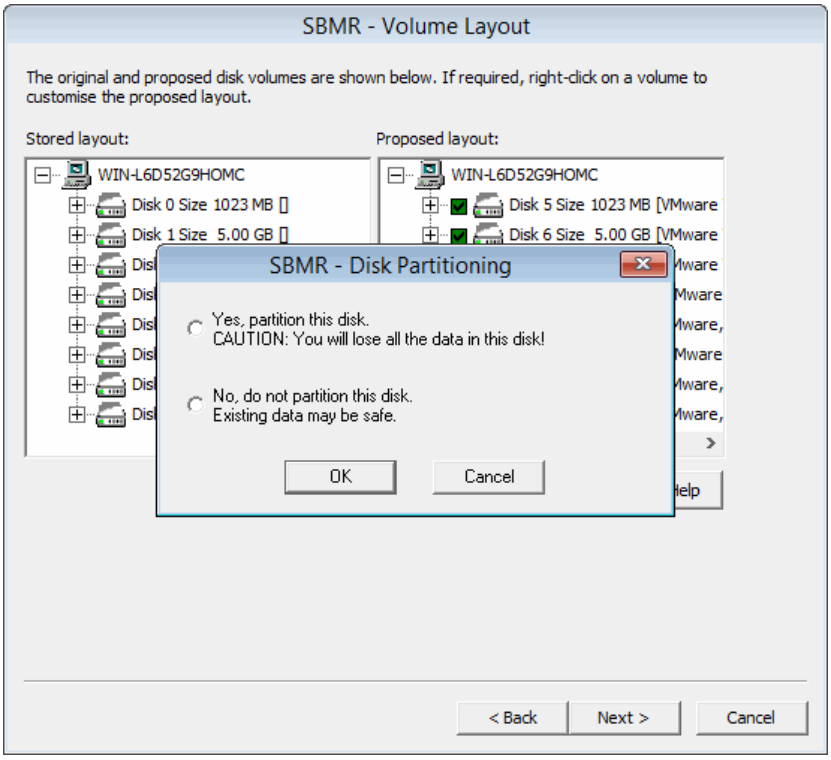
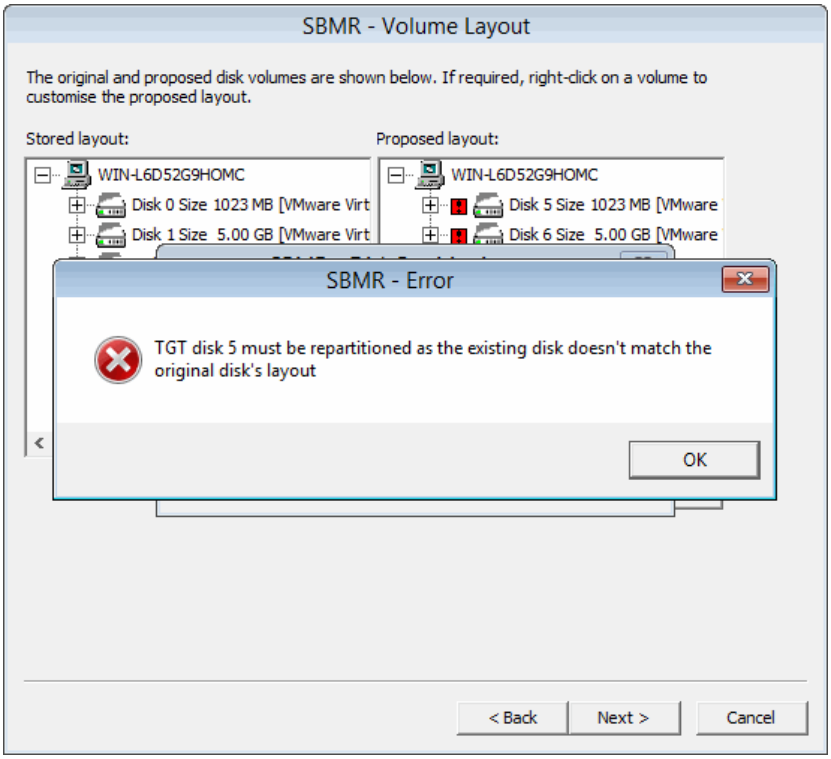
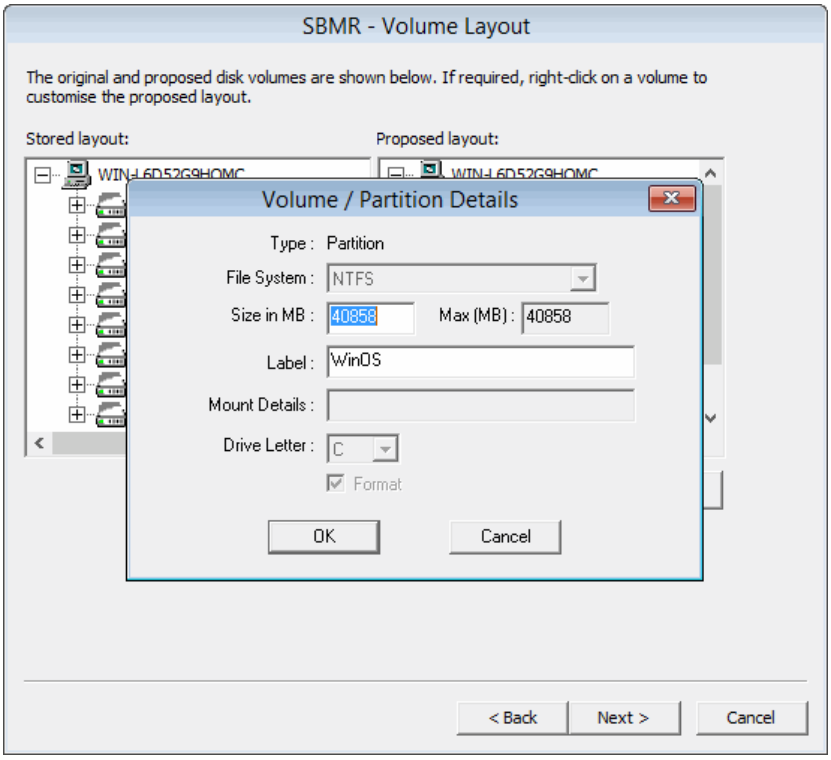

SBMR - Volume Layout
The original and proposed disk volumes are shown below. If required, right-click on a volume to customise the proposed layout.
Stored layout:
Proposed layout:
WIN-L6D52G9HOMC
Disk 0 Size 1023 MB []
Disk 1 Size 5.00 GB []
WIN-L6D52G9HOMC
Disk 5 Size 1023 MB [VMware
Disk 6 Size 5.00 GB [VMware
SBMR - Disk Partitioning
Yes, partition this disk.
CAUTION: You will lose all the data in this disk!
No, do not partition this disk.
Existing data may be safe.
OK
Cancel
< Back
Next >
Cancel

Any attempt to incorrectly turn off formatting will result in this error:


SBMR - Volume Layout
The original and proposed disk volumes are shown below. If required, right-click on a volume to customise the proposed layout.
Stored layout:
Proposed layout:
WIN-L6D52G9HOMC
Disk 0 Size 1023 MB [VMware Virt
Disk 1 Size 5.00 GB [VMware Virt
WIN-L6D52G9HOMC
Disk 5 Size 1023 MB [VMware
Disk 6 Size 5.00 GB [VMware
SBMR - Error
TGT disk 5 must be repartitioned as the existing disk doesn't match the original disk's layout
OK
< Back
Next >
Cancel

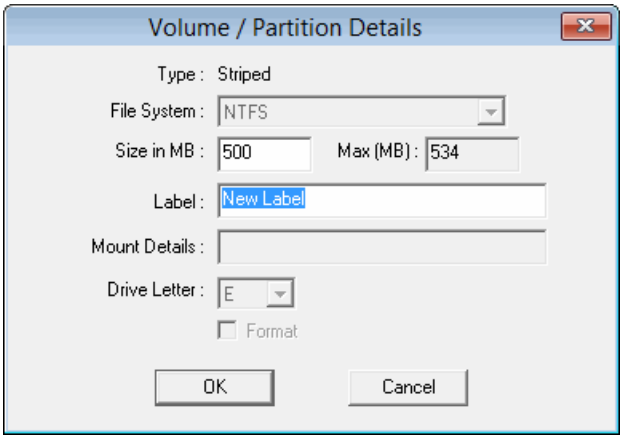
You may also right-click on a partition to allow you to selectively modify the partition parameters or remove it altogether.



You may **Modify** the following partition parameters:

- size in MB (only if disk is shown with a)
- label
- format (yes/no)

The screenshot below shows an example:



Select **Delete** to remove the partition completely (only if disk is shown with a).

If you attempt to either not format or delete a Windows system partition, an error such as this will be displayed:

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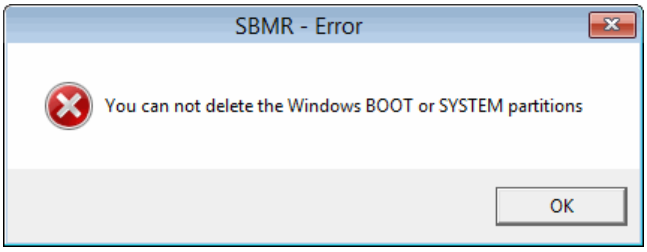
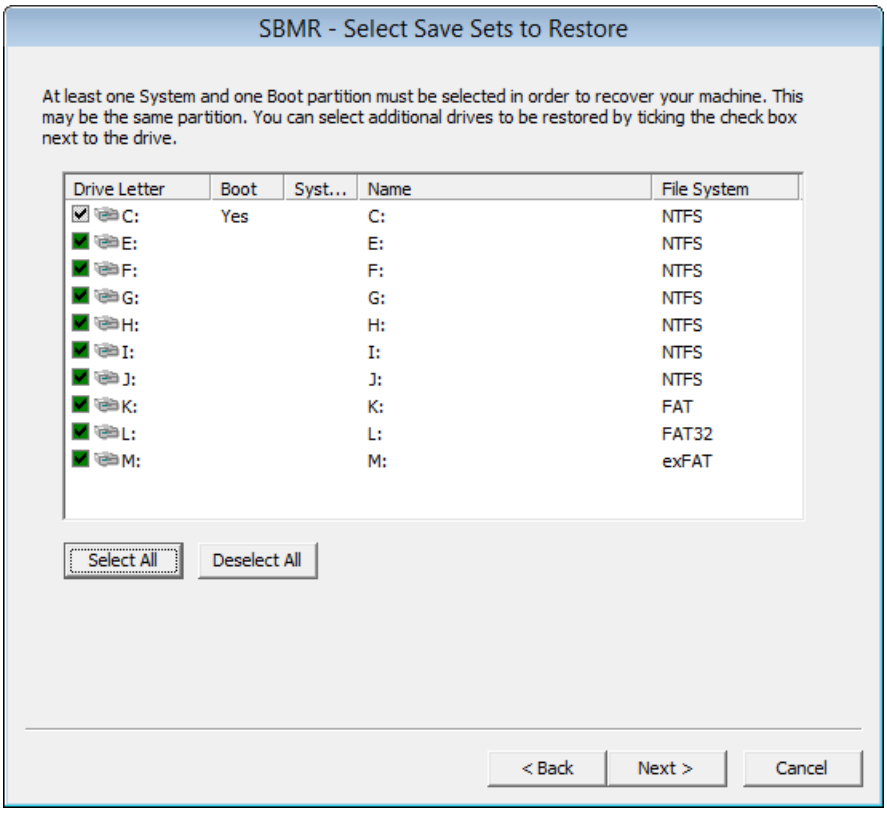


At this stage, nothing has happened to the disks. Press Next> to continue with the recovery.

7.2.2.3 Select Filespaces To Restore

The next step prompts for the filespaces to restore. Generally, each filespace represents a disk partition or volume. Put a tick against each filespace that should be restored:

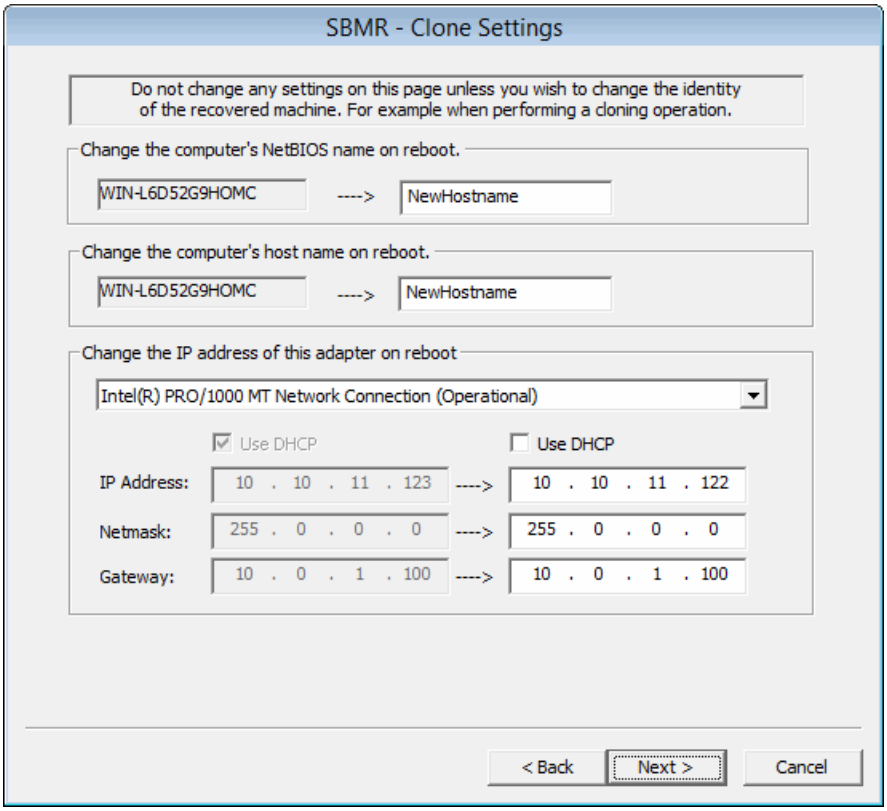

SBMR - Select Save Sets to Restore
At least one System and one Boot partition must be selected in order to recover your machine. This may be the same partition. You can select additional drives to be restored by ticking the check box next to the drive.
Drive Letter
Boot
Syst...
Name
File System
C: Yes C: NTFS
E: E: NTFS
F: F: NTFS
G: G: NTFS
H: H: NTFS
I: I: NTFS
J: J: NTFS
K: K: FAT
L: L: FAT32
M: M: exFAT
Select All
Deselect All
< Back
Next >
Cancel

Note: the system and boot partitions (even if on different partitions) will always be restored by default.

Click Next> to continue to the next step.

7.2.2.4 Clone Settings

Use this dialogue to change the recovered system's **hostname** and **IP addresses** if required. Select to use either DHCP or enter a valid static IP address.


SBMR - Clone Settings
Do not change any settings on this page unless you wish to change the identity of the recovered machine. For example when performing a cloning operation.
Change the computer's NetBIOS name on reboot.
WIN-L6D52G9HOMC
---->
NewHostname
Change the computer's host name on reboot.
WIN-L6D52G9HOMC
---->
NewHostname
Change the IP address of this adapter on reboot
Intel(R) PRO/1000 MT Network Connection (Operational)
Use DHCP
Use DHCP
IP Address:
10 . 10 . 11 . 123
---->
10 . 10 . 11 . 122
Netmask:
255 . 0 . 0 . 0
---->
255 . 0 . 0 . 0
Gateway:
10 . 0 . 1 . 100
---->
10 . 0 . 1 . 100
< Back
Next >
Cancel

You may change the IP address for each NIC interface independently. NICs that are currently connected to a network are tagged with **(Operational)**.

If you wish to retain the current hostname and IP addresses leave the fields at their default values and select Next> to continue to the next section.

7.2.2.5 Dissimilar Hardware

Next, the DR process performs a check to determine if there are new devices in the recovering machine that were not present in the original system. If this is true, then this is a 'dissimilar' DR and the following dialogue will be shown to allow the user to specify the location of the new driver files for these devices.

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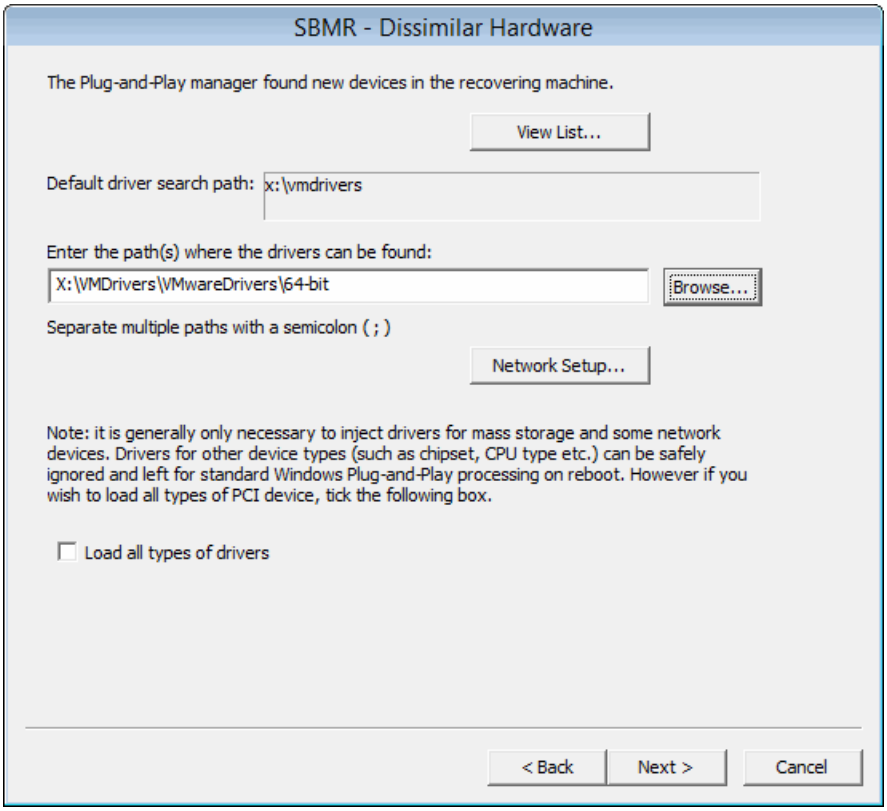
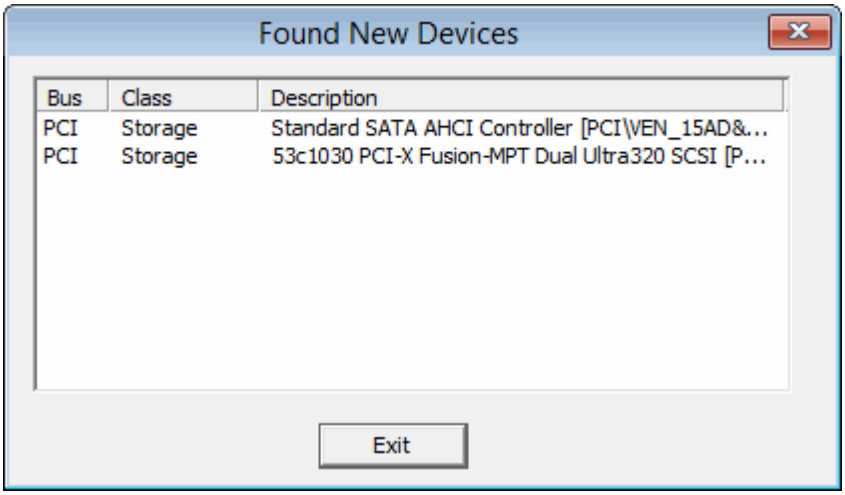

SBMR - Dissimilar Hardware
The Plug-and-Play manager found new devices in the recovering machine.
View List...
Default driver search path:
x:\vmdrivers
Enter the path(s) where the drivers can be found:
X:\VMDrivers\VMwareDrivers\64-bit
Browse...
Separate multiple paths with a semicolon (;)
Network Setup...
Note: it is generally only necessary to inject drivers for mass storage and some network devices. Drivers for other device types (such as chipset, CPU type etc.) can be safely ignored and left for standard Windows Plug-and-Play processing on reboot. However if you wish to load all types of PCI device, tick the following box.
Load all types of drivers
< Back
Next >
Cancel

Specify the default path or paths to be searched for the missing driver files. The paths may be on a local device (eg. a USB disk) or a network share. Use the Network Setup... button if you need to map a network share. In either case, the paths must be accessible to the WinPE 5 environment.

Select View List... to see a list of the new devices.



Ensure the specified path or paths contain the correct drivers for the dissimilar machine (ie. correct 32 or 64-bit version as appropriate for the OS). At the end of the DR sequence, the specified paths will be searched for the missing drivers and automatically injected into the recovered system.

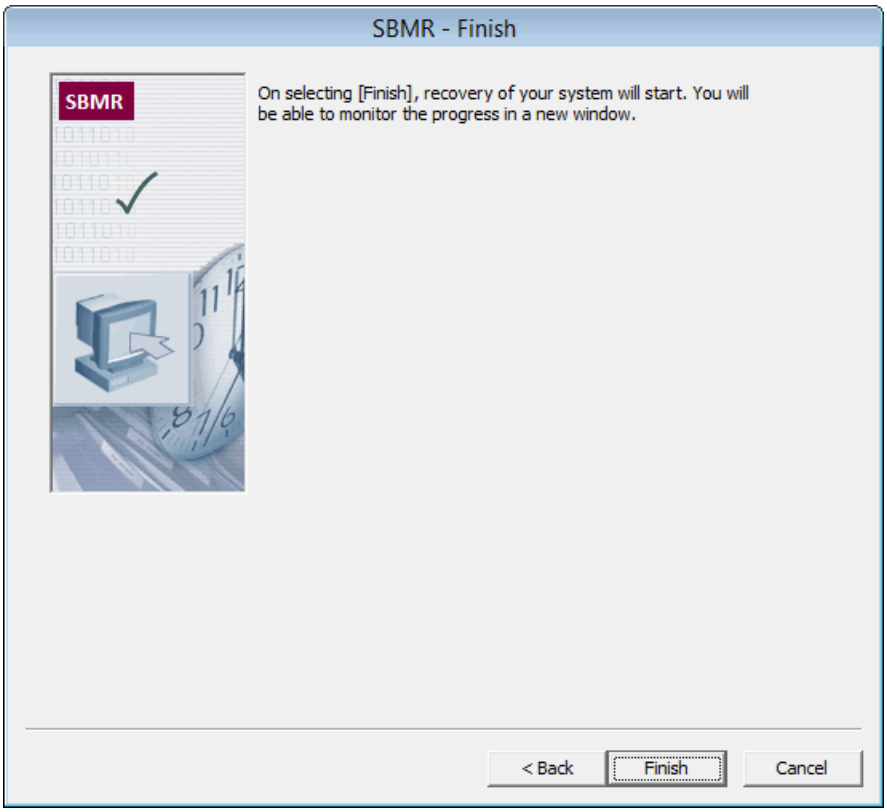
By default, it is only necessary to inject drivers for mass storage devices and, in some some cases, network devices. The 'Load all types of drivers' tick box will force the DR to look for all drivers in addition to mass storage and network devices. For example, this could include graphics cards, USB and chipset devices, but these are rarely required and not recommended.

Note that if drivers are not found for the new boot disk then, although WinPE 5 will be able to recover the files to the disk, there is a good chance that it will not boot correctly.

Press Next> to proceed with the recovery.

7.2.2.6 Proceed With The Recovery

Before continuing with the actual file recovery, a final warning screen is displayed.


SBMR - Finish
SBMR
On selecting [Finish], recovery of your system will start. You will be able to monitor the progress in a new window.
< Back
Finish
Cancel

If you are happy with the specified recovery configuration, press Finish. This will commence the **actual** file recovery.

> ***Note: this procedure will COMPLETELY DESTROY any existing data on those disks selected for format (ie. shown with a). Disks or partitions tagged as no format (ie. shown with a) will remain intact.***

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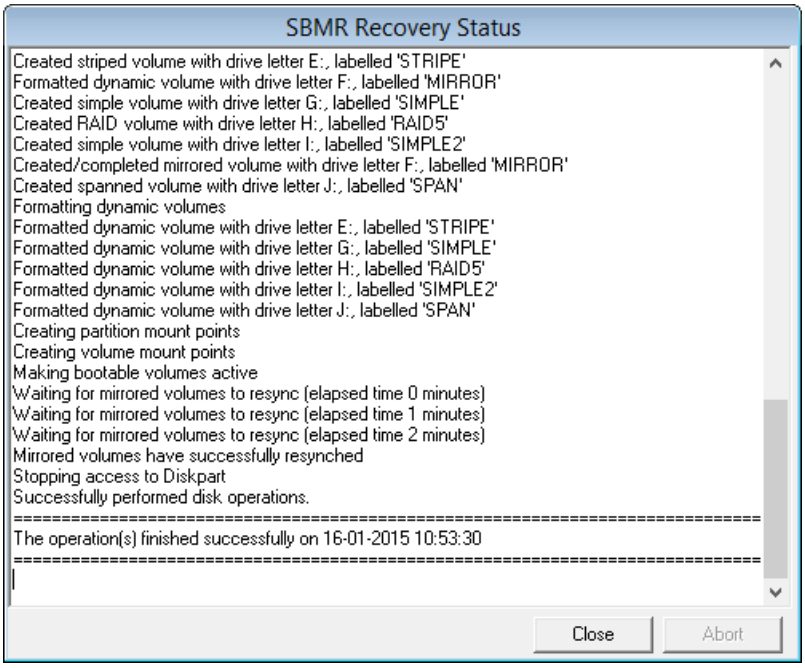
Disk Recovery Sequence

The **Recovery Sequence** begins by preparing the disks selected for the recovery.

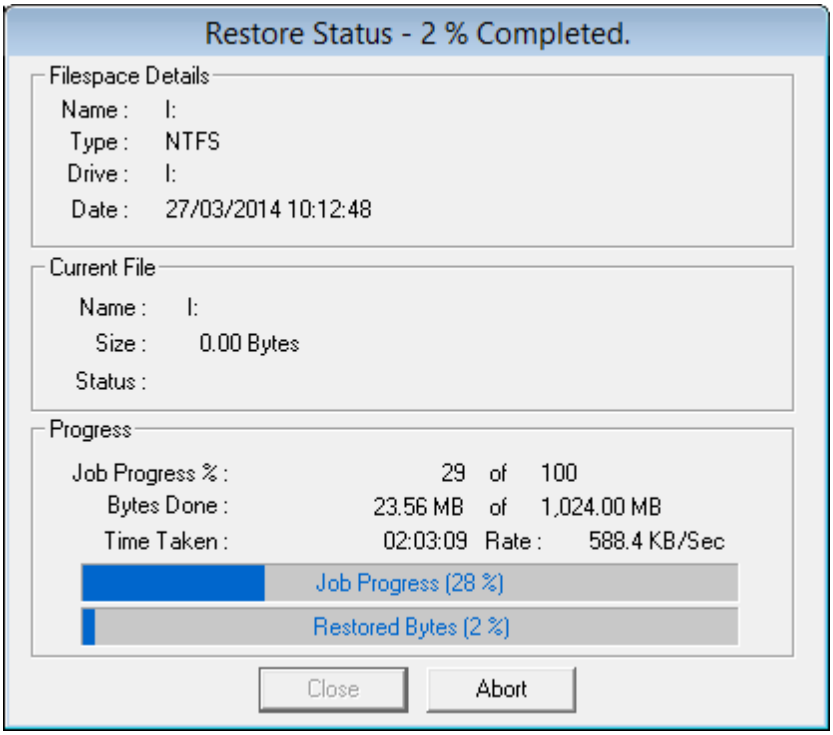

SBMR Recovery Status
Created striped volume with drive letter E:, labelled 'STRIPE'
Formatted dynamic volume with drive letter F:, labelled 'MIRROR'
Created simple volume with drive letter G:, labelled 'SIMPLE'
Created RAID volume with drive letter H:, labelled 'RAID5'
Created simple volume with drive letter I:, labelled 'SIMPLE2'
Created/completed mirrored volume with drive letter F:, labelled 'MIRROR'
Created spanned volume with drive letter J:, labelled 'SPAN'
Formatting dynamic volumes
Formatted dynamic volume with drive letter E:, labelled 'STRIPE'
Formatted dynamic volume with drive letter G:, labelled 'SIMPLE'
Formatted dynamic volume with drive letter H:, labelled 'RAID5'
Formatted dynamic volume with drive letter I:, labelled 'SIMPLE2'
Formatted dynamic volume with drive letter J:, labelled 'SPAN'
Creating partition mount points
Creating volume mount points
Making bootable volumes active
Waiting for mirrored volumes to resync (elapsed time 0 minutes)
Waiting for mirrored volumes to resync (elapsed time 1 minutes)
Waiting for mirrored volumes to resync (elapsed time 2 minutes)
Mirrored volumes have successfully resynched
Stopping access to Diskpart
Successfully performed disk operations.
The operation(s) finished successfully on 16-01-2015 10:53:30
Close
Abort

This involves:

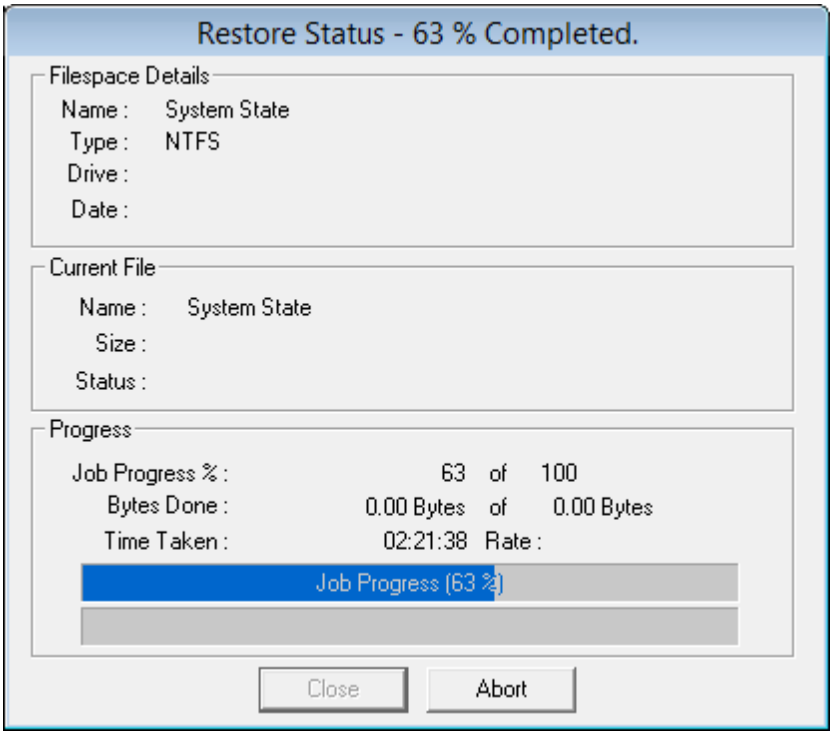
- disk mapping original layout to new
- cleaning (removing any existing disk partitions)
- removing any existing dynamic volume databases
- re-creating the partitions
- converting to dynamic volumes if required
- formatting to the required partition type
- create partition/volume mount points
- make bootable volumes active

The next step is to recover the filespaces to the selected target disks/partitions. A new window appears containing the restore status of recovered files, with progress bars indicating how much of the backup has been restored. This display also shows the recovery statistics in terms of time, size and throughput.

The recovery is divided into different phases: first the recovery of each volume selected,



followed by the *SystemState*:



This process may take some minutes if the backups are large. You may select the Abort button to terminate the file recovery process, but this may leave a disk or partition in an unpredictable state, which may render it unusable.

If any errors occur during the recovery, an error message will be shown in the window. Refer to the logs post recovery to establish the cause of any error. The final steps of the recovery are to:

- run a sanity check to determine if all the expected boot files are present on the boot volume

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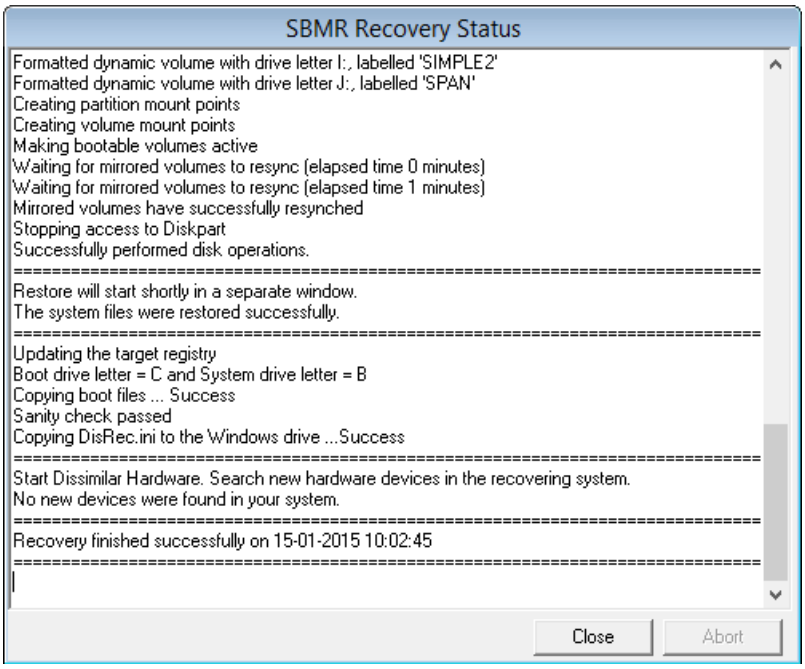
- run a dissimilar hardware check to determine if new drivers are required for new boot devices

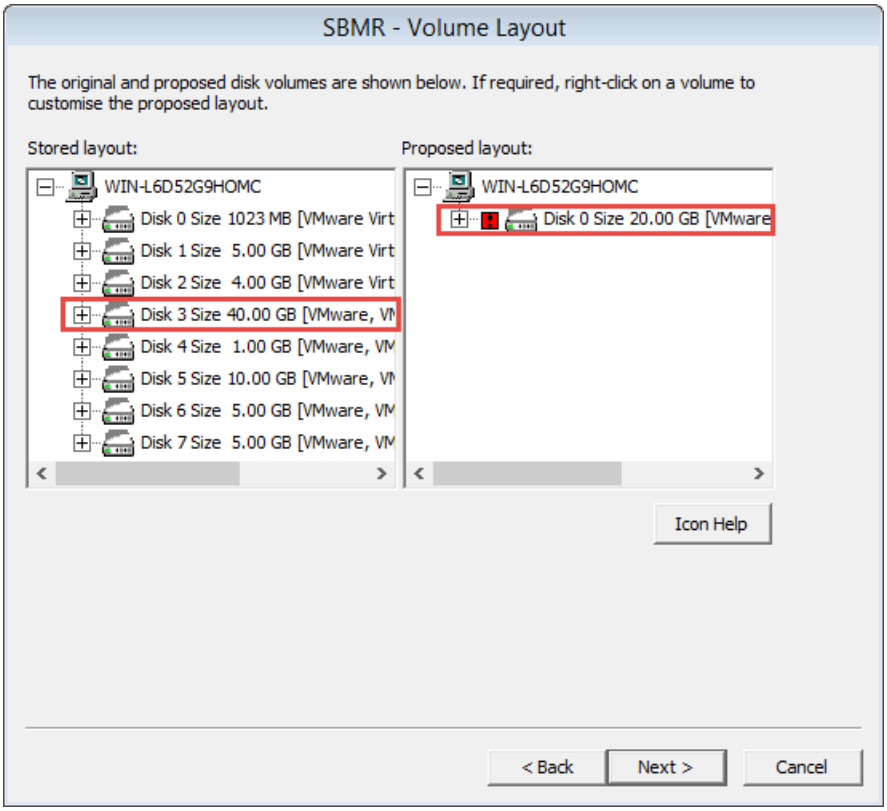

SBMR Recovery Status
Formatted dynamic volume with drive letter I:, labelled 'SIMPLE2'
Formatted dynamic volume with drive letter J:, labelled 'SPAN'
Creating partition mount points
Creating volume mount points
Making bootable volumes active
Waiting for mirrored volumes to resync (elapsed time 0 minutes)
Waiting for mirrored volumes to resync (elapsed time 1 minutes)
Mirrored volumes have successfully resynched
Stopping access to Diskpart
Successfully performed disk operations.
Restore will start shortly in a separate window.
The system files were restored successfully.
Updating the target registry
Boot drive letter = C and System drive letter = B
Copying boot files ... Success
Sanity check passed
Copying DisRec.ini to the Windows drive ...Success
Start Dissimilar Hardware. Search new hardware devices in the recovering system.
No new devices were found in your system.
Recovery finished successfully on 15-01-2015 10:02:45
Close
Abort

Finally, press Close to return to the **Recovery Console** main menu. At this point, you may want to view the recovery logs and perhaps copy the logs to a local device or remote share before selecting to reboot.

> ***Note:recovery logs are also saved to the recovered system to the SBMR installation sub-folder 'Temp' (e.g. "C:\Program Files\Cristie\SBMR\Temp")***

Disk Scaling

In situations where the target system has fewer or smaller disks than the original system, *Disk Scaling* will come into effect.


SBMR - Volume Layout
The original and proposed disk volumes are shown below. If required, right-click on a volume to customise the proposed layout.
Stored layout:
Proposed layout:
WIN-L6D52G9HOMC
Disk 0 Size 1023 MB [VMware Virt
Disk 1 Size 5.00 GB [VMware Virt
Disk 2 Size 4.00 GB [VMware Virt
Disk 3 Size 40.00 GB [VMware, VM
Disk 4 Size 1.00 GB [VMware, VM
Disk 5 Size 10.00 GB [VMware, VM
Disk 6 Size 5.00 GB [VMware, VM
Disk 7 Size 5.00 GB [VMware, VM
WIN-L6D52G9HOMC
Disk 0 Size 20.00 GB [VMware
Icon Help
< Back
Next >
Cancel

The above example shows a recovery from an original system with 8 physical disks, to a target system with only one disk. The target disk is also much smaller than the original system disk. Note in this scenario the OS will be restored to the single disk.

In this scenario, SBMR will select as many disks to recover as possible (in this case only one disk - the boot disk). In addition, it will scale the partitions down in proportion to their original size and occupancy. This can be complicated by having, say, mirrored dynamic volumes when the mirror will need to be broken - if only one disk exists on the target (or it has been tagged as not to modify).

> ***Note 1: the Volume Layout dialogue will only show disks in the left hand panel that can be recovered.***

> ***Note 2: during a recovery to a system with larger disks, the partition sizes will remain the same as the original by default. However, in this case, it is possible to increase partition size manually during the recovery by right-clicking on the partition icon and selecting Modify.***

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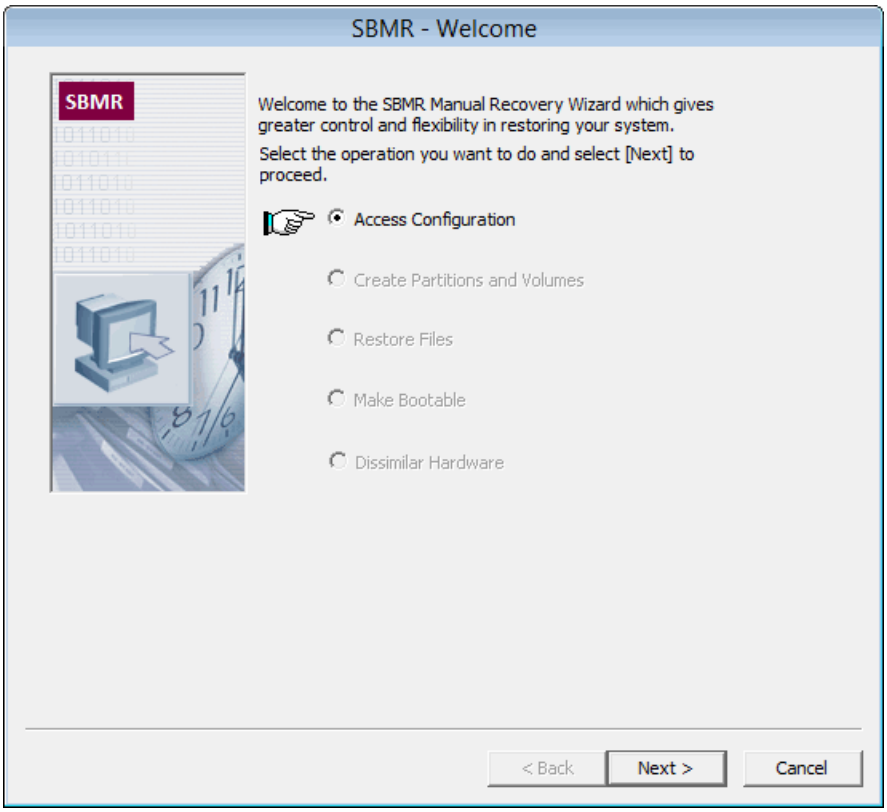
7.2.3 Start the manual Recovery wizard

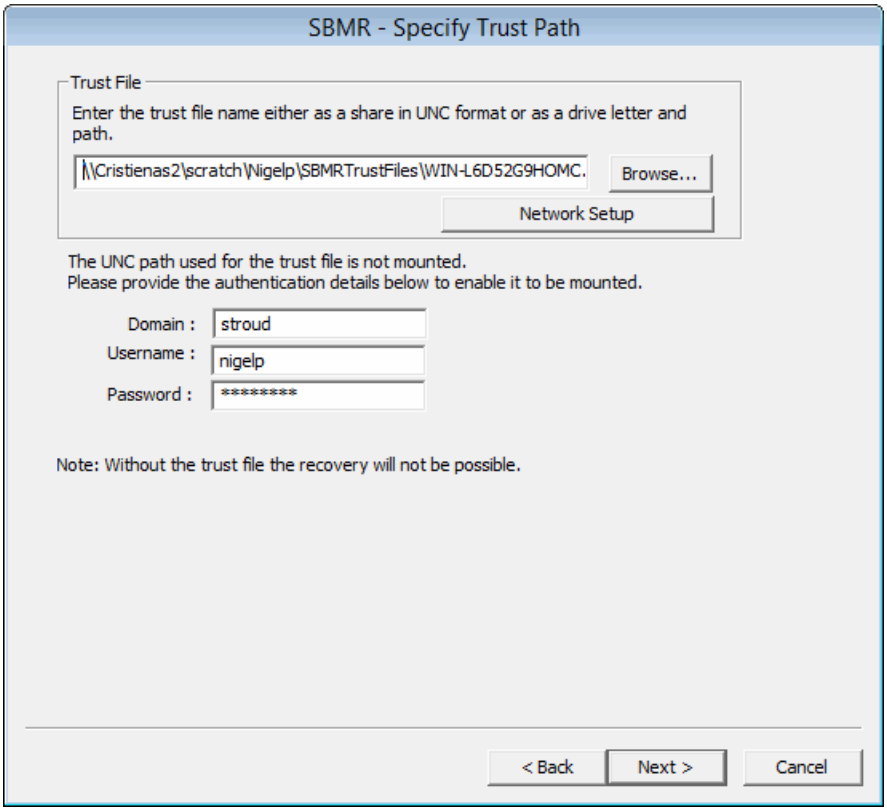
Select the **Start the manual Recovery wizard** to commence a manual DR sequence. This option will stop after each step in the DR sequence allowing the DR to be aborted or the step to be repeated with different parameters.

7.2.3.1 Locate Configuration

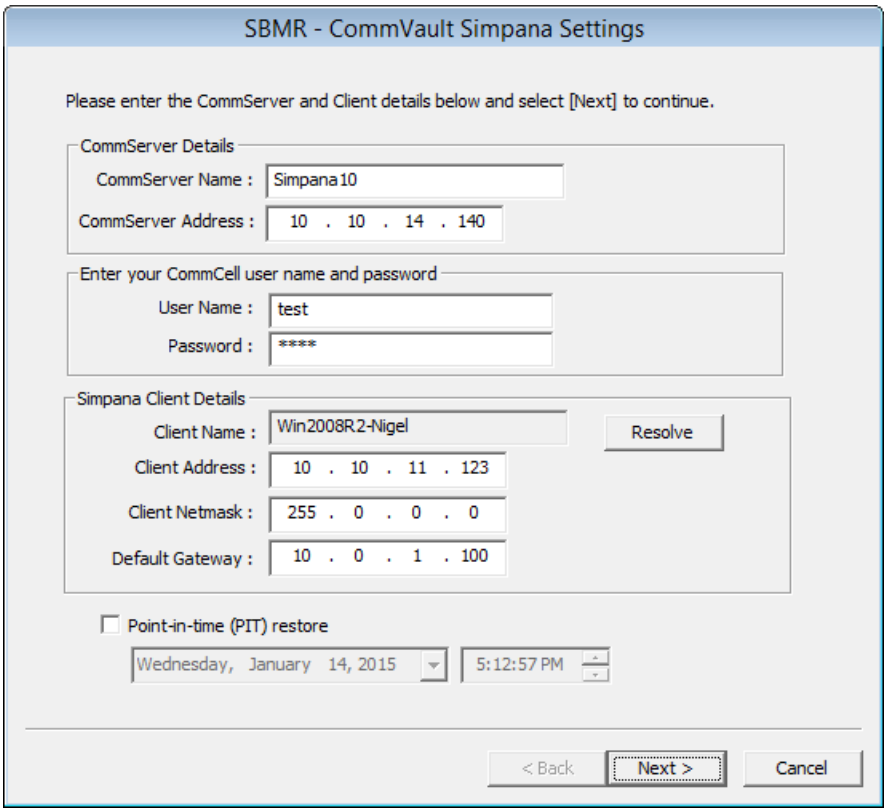
The first step of the manual DR sequence is to extract the DR configuration from the backup on the CommVault Simpana server.


SBMR - Welcome
SBMR
Welcome to the SBMR Manual Recovery Wizard which gives greater control and flexibility in restoring your system.
Select the operation you want to do and select [Next] to proceed.
Access Configuration
Create Partitions and Volumes
Restore Files
Make Bootable
Dissimilar Hardware
< Back
Next >
Cancel

Click Next> to proceed to the first step of the sequence. Click Cancel to abort the recovery sequence at this point. First you must specify the location of your **Trust** file. This was created during the install of SBMR on the original host system. This may reside on a network share or a USB disk. The example shows a UNC path so the access credentials must also be specified.


SBMR - Specify Trust Path
Trust File
Enter the trust file name either as a share in UNC format or as a drive letter and path.
\\Cristienas2\scratch\Nigelp\SBMRTrustFiles\WIN-L6D52G9HOMC.
Browse...
Network Setup
The UNC path used for the trust file is not mounted.
Please provide the authentication details below to enable it to be mounted.
Domain : stroud
Username : nigelp
Password : *********
Note: Without the trust file the recovery will not be possible.
< Back
Next >
Cancel

Enter a valid path and click Next> to load the **Trust** file and continue.


SBMR - CommVault Simpana Settings
Please enter the CommServer and Client details below and select [Next] to continue.
CommServer Details
CommServer Name : Simpana10
CommServer Address : 10 . 10 . 14 . 140
Enter your CommCell user name and password
User Name : test
Password : ****
Simpana Client Details
Client Name : Win2008R2-Nigel
Resolve
Client Address : 10 . 10 . 11 . 123
Client Netmask : 255 . 0 . 0 . 0
Default Gateway : 10 . 0 . 1 . 100
Point-in-time (PIT) restore
Wednesday, January 14, 2015
5:12:57 PM
< Back
Next >
Cancel

Specify the location of the **CommVault Simpana Server** and **Client** used to back up the host.

> ***Note: The supplied Client address must be the original source system's IP address. If you wish to clone to a new IP address use the option provided in the section Clone Settings.***

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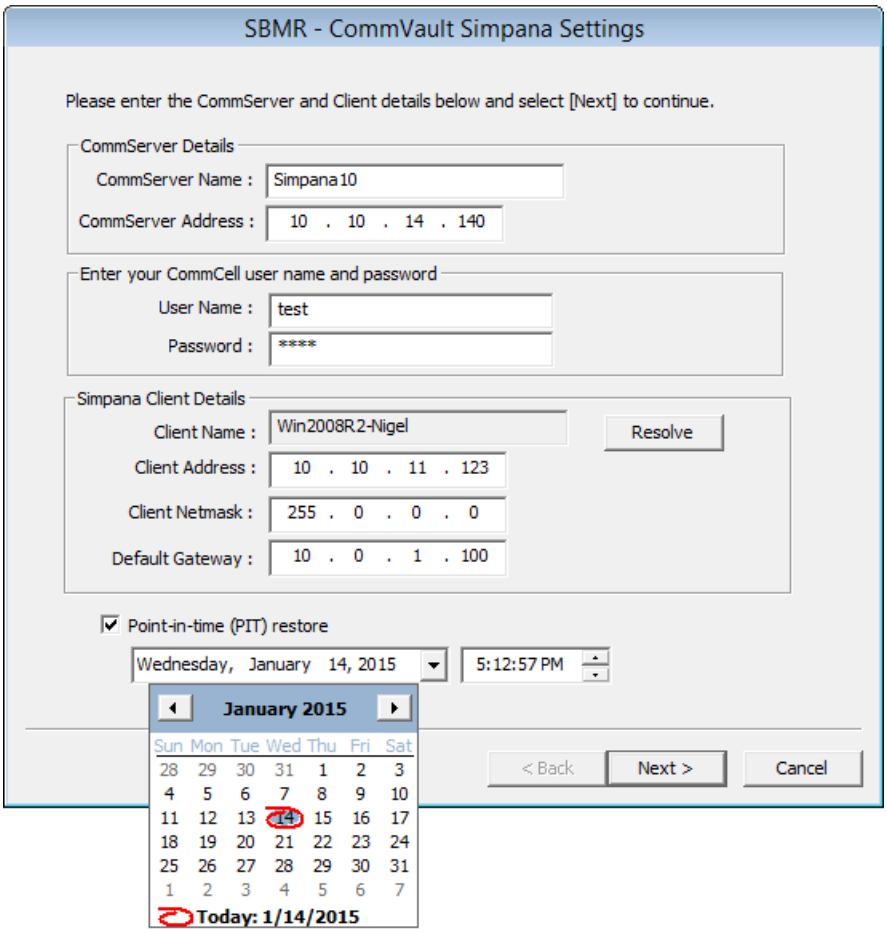
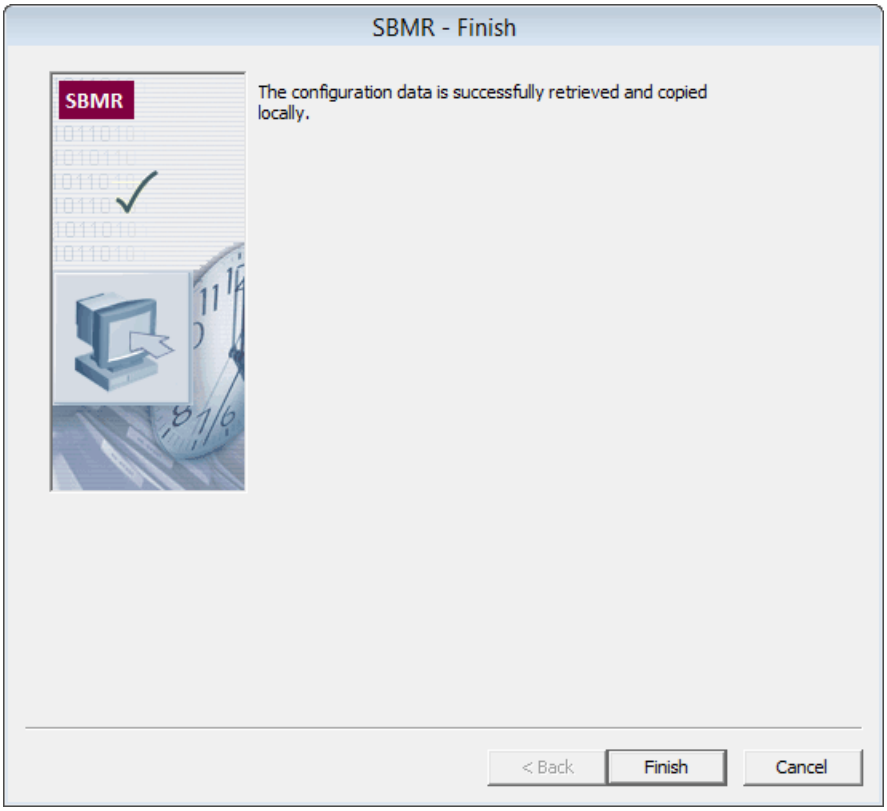
Selecting the **Point-in-time** (PIT) restore mode will allow the system to be recovered from the most recent backup before the specified date and time. This means the version of any file restored will be earlier than the specified date and time. Selecting the down-arrow in the calendar control will bring up a calendar:


SBMR - CommVault Simpana Settings
Please enter the CommServer and Client details below and select [Next] to continue.
CommServer Details
CommServer Name : Simpana10
CommServer Address : 10 . 10 . 14 . 140
Enter your CommCell user name and password
User Name : test
Password : ****
Simpana Client Details
Client Name : Win2008R2-Nigel
Resolve
Client Address : 10 . 10 . 11 . 123
Client Netmask : 255 . 0 . 0 . 0
Default Gateway : 10 . 0 . 1 . 100
Point-in-time (PIT) restore
Wednesday, January 14, 2015
5:12:57 PM
January 2015
Sun Mon Tue Wed Thu Fri Sat
28 29 30 31 1 2 3
4 5 6 7 8 9 10
11 12 13 14 15 16 17
18 19 20 21 22 23 24
25 26 27 28 29 30 31
1 2 3 4 5 6 7
Today: 1/14/2015
< Back
Next >
Cancel

This can be used to scroll the months/years backwards and forwards as necessary.

> ***Note: a future date will result in the latest backup being recovered.***

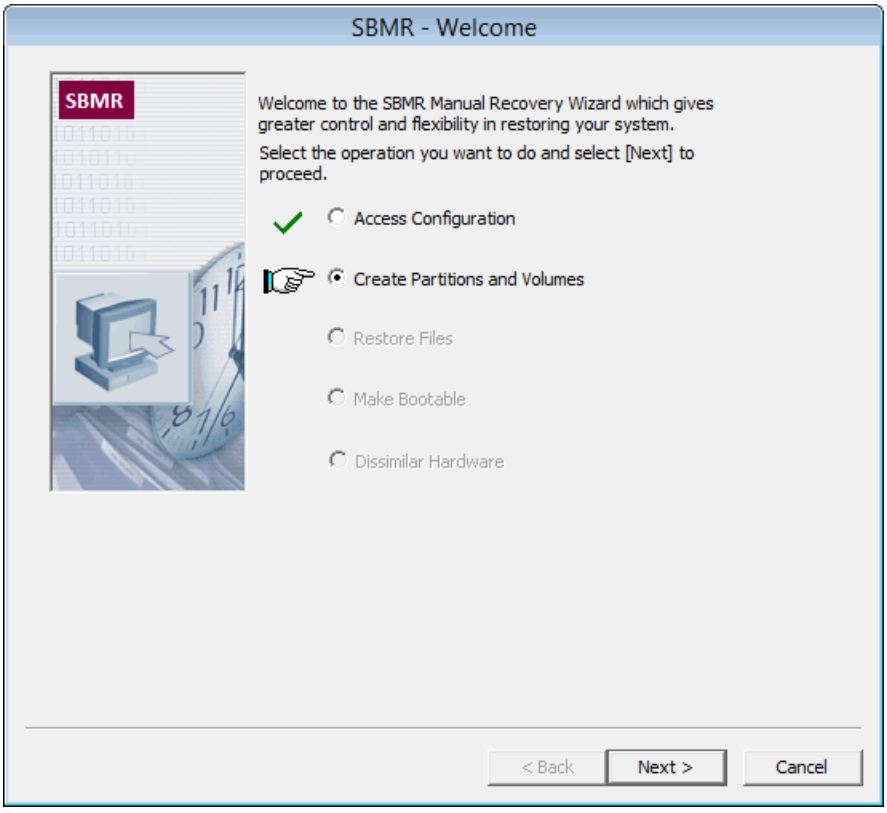
The CommVault Simpana server will now be contacted and the stored system configuration extracted. Successful extraction of the configuration from the server is confirmed with the following dialogue:



Click Finish and control returns to the next step in the **Manual Recovery** sequence.

7.2.3.2 Create Partition and Volumes

The next step of the manual recovery process is to configure the target disk **partitions** and **volumes**


SBMR - Welcome
SBMR
Welcome to the SBMR Manual Recovery Wizard which gives greater control and flexibility in restoring your system.
Select the operation you want to do and select [Next] to proceed.
Access Configuration
Create Partitions and Volumes
Restore Files
Make Bootable
Dissimilar Hardware
< Back
Next >
Cancel

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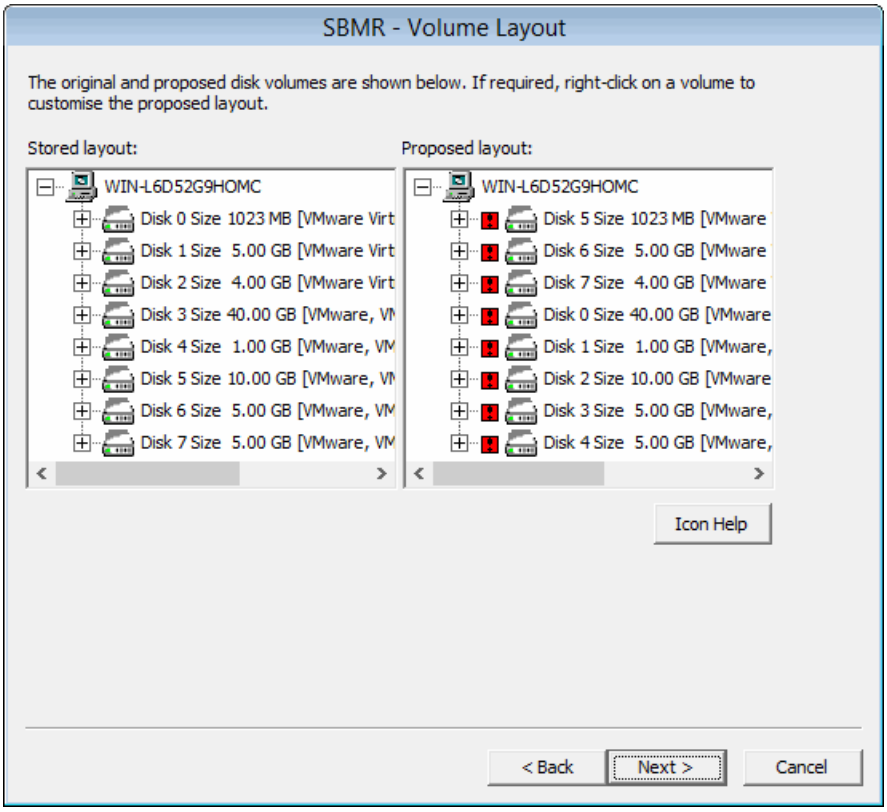
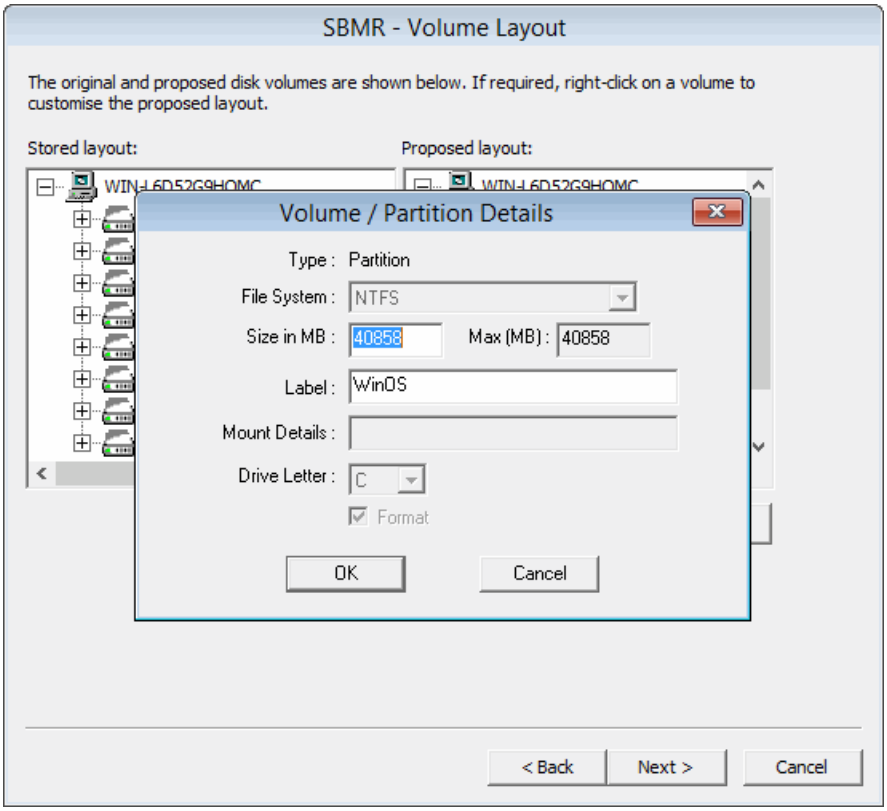
Click Next> to display the Volume Layout dialogue:


SBMR - Volume Layout
The original and proposed disk volumes are shown below. If required, right-click on a volume to customise the proposed layout.
Stored layout:
Proposed layout:
WIN-L6D52G9HOMC
Disk 0 Size 1023 MB [VMware Virt
Disk 1 Size 5.00 GB [VMware Virt
Disk 2 Size 4.00 GB [VMware Virt
Disk 3 Size 40.00 GB [VMware, VM
Disk 4 Size 1.00 GB [VMware, VM
Disk 5 Size 10.00 GB [VMware, VM
Disk 6 Size 5.00 GB [VMware, VM
Disk 7 Size 5.00 GB [VMware, VM
WIN-L6D52G9HOMC
Disk 5 Size 1023 MB [VMware
Disk 6 Size 5.00 GB [VMware
Disk 7 Size 4.00 GB [VMware
Disk 0 Size 40.00 GB [VMware
Disk 1 Size 1.00 GB [VMware,
Disk 2 Size 10.00 GB [VMware
Disk 3 Size 5.00 GB [VMware,
Disk 4 Size 5.00 GB [VMware,
Icon Help
< Back
Next >
Cancel

This screen shows the original disk layout against that of the target system. The target disk layout could be very different to the original. SBMR will attempt to match the disks using its own in-built criteria. Some of the criteria used to judge the match are:

- disk geometry (tracks, cylinders and sectors)
- disk capacity
- if currently formatted, the disk signature

However, it is possible to change the partition size, or opt to tag/untag whether or not a partition should be formatted. To do this, right click on the the disk icon and the following configuration dialogue is displayed:



The indicator shown next to the disk icon indicates whether that disk will be left intact or not. A red exclamation mark indicates that the disk will be re-partitioned and/or formatted. A green tick indicates that the disk will be left intact.

Disks and partitions are discussed in more detail in the Confirm Volume Layout section.

Click <Back to return to the previous step, Finish to commence the active part of this step, or Cancel to abort.

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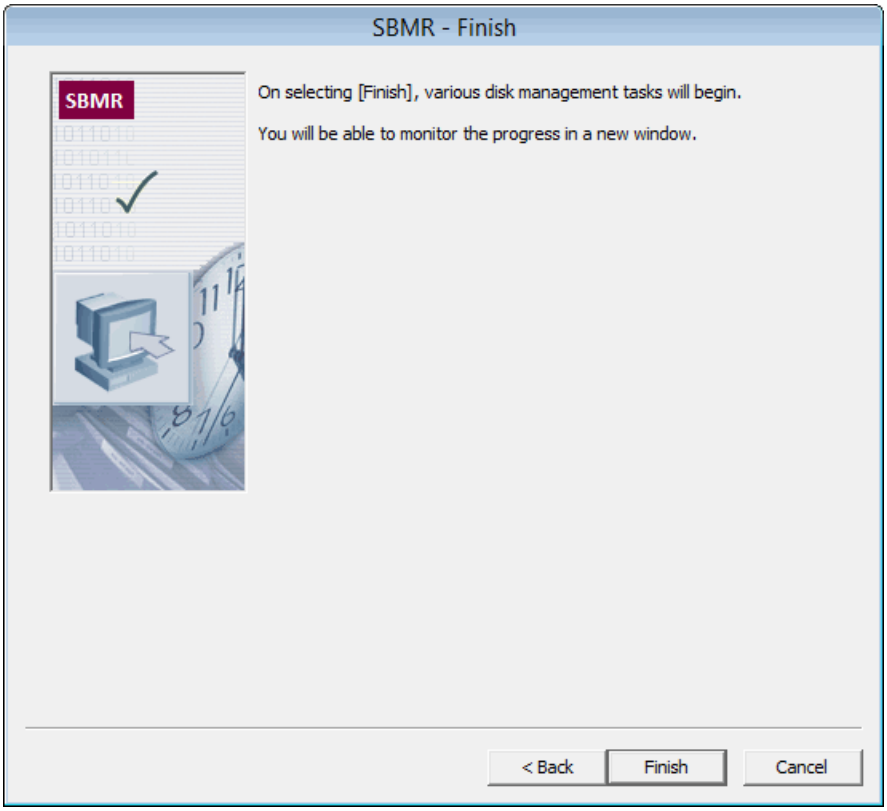
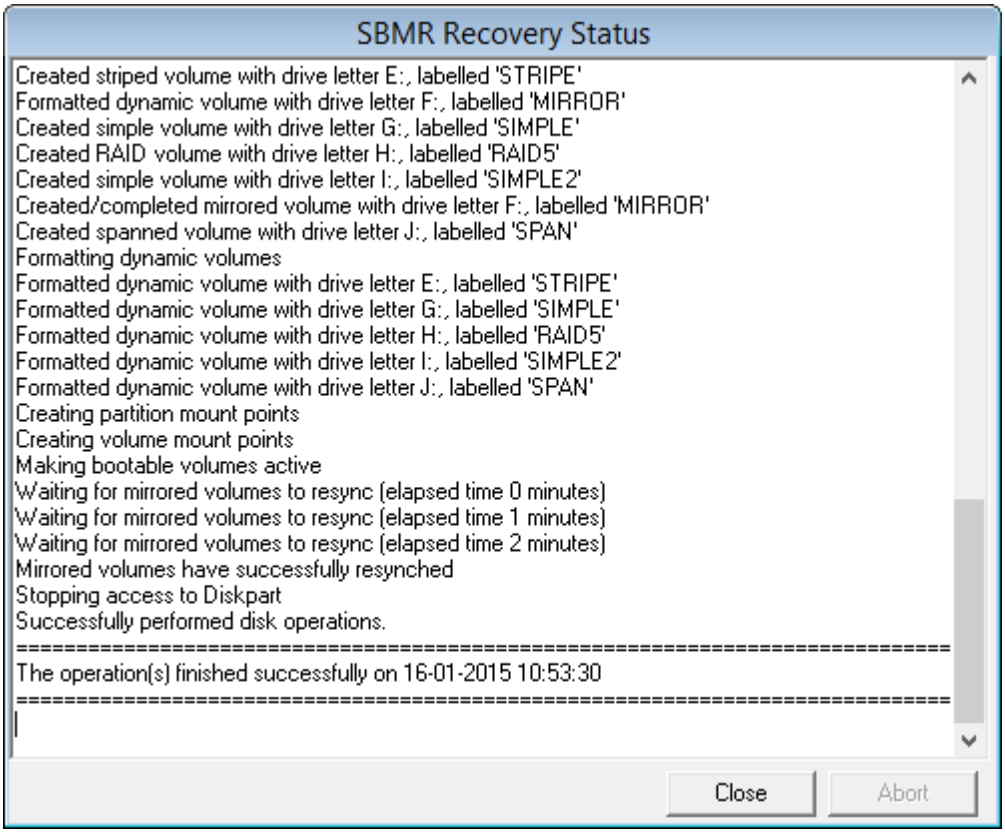

SBMR - Finish
SBMR
On selecting [Finish], various disk management tasks will begin.
You will be able to monitor the progress in a new window.
< Back
Finish
Cancel

If you are happy with the recovery configuration, click Finish. This will commence the actual recovery.

> *Note: this procedure will completely destroy any existing data on the disks selected for recovery. Disks or partitions tagged as 'no format' will be retained.*

The **Create Partitions and Volumes** step begins by preparing the disk(s) selected for the recovery.


SBMR Recovery Status
Created striped volume with drive letter E:, labelled 'STRIPE'
Formatted dynamic volume with drive letter F:, labelled 'MIRROR'
Created simple volume with drive letter G:, labelled 'SIMPLE'
Created RAID volume with drive letter H:, labelled 'RAID5'
Created simple volume with drive letter I:, labelled 'SIMPLE2'
Created/completed mirrored volume with drive letter F:, labelled 'MIRROR'
Created spanned volume with drive letter J:, labelled 'SPAN'
Formatting dynamic volumes
Formatted dynamic volume with drive letter E:, labelled 'STRIPE'
Formatted dynamic volume with drive letter G:, labelled 'SIMPLE'
Formatted dynamic volume with drive letter H:, labelled 'RAID5'
Formatted dynamic volume with drive letter I:, labelled 'SIMPLE2'
Formatted dynamic volume with drive letter J:, labelled 'SPAN'
Creating partition mount points
Creating volume mount points
Making bootable volumes active
Waiting for mirrored volumes to resync (elapsed time 0 minutes)
Waiting for mirrored volumes to resync (elapsed time 1 minutes)
Waiting for mirrored volumes to resync (elapsed time 2 minutes)
Mirrored volumes have successfully resynched
Stopping access to Diskpart
Successfully performed disk operations.
The operation(s) finished successfully on 16-01-2015 10:53:30
Close
Abort

This involves:

- disk mapping original layout to new
- cleaning (removing any existing disk partitions)
- removing any existing dynamic volume databases
- re-creating the partitions
- converting to dynamic volumes if required
- formatting to the required partition type
- create partition/volume mount points
- make bootable volumes active

Click Close> to continue with the recovery.

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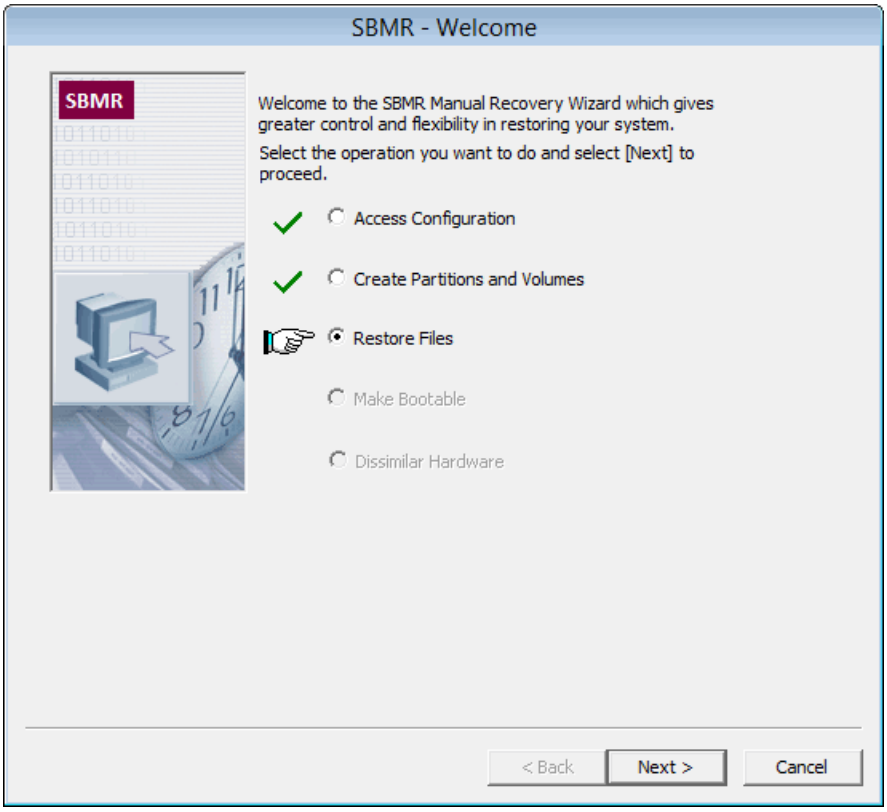
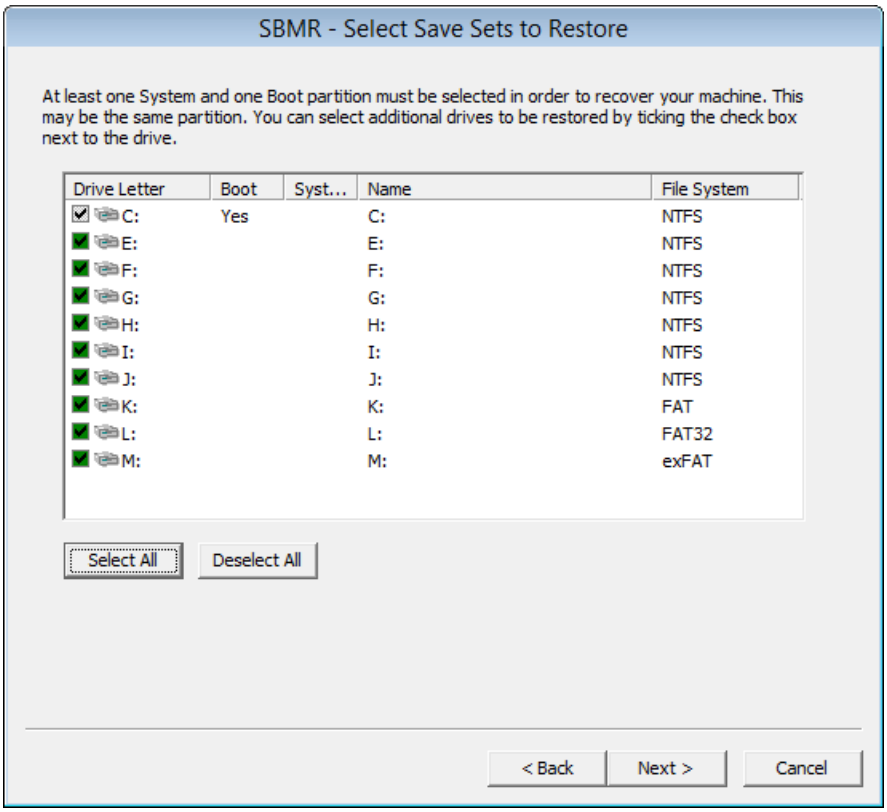
7.2.3.3 Restore Files

The next step of the manual recovery process is to restore the DR backup files.


SBMR - Welcome
SBMR
Welcome to the SBMR Manual Recovery Wizard which gives greater control and flexibility in restoring your system.
Select the operation you want to do and select [Next] to proceed.
Access Configuration
Create Partitions and Volumes
Restore Files
Make Bootable
Dissimilar Hardware
< Back
Next >
Cancel

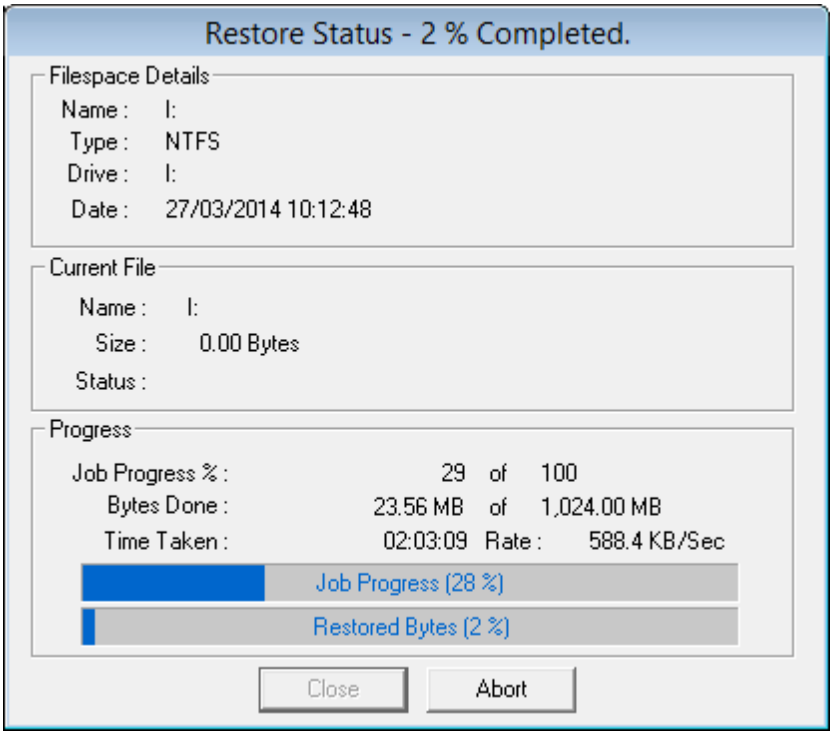
Click Next> to identify the TSM filespaces that should be recovered. Note that the *SystemState* filespace will always be recovered by default.


SBMR - Select Save Sets to Restore
At least one System and one Boot partition must be selected in order to recover your machine. This may be the same partition. You can select additional drives to be restored by ticking the check box next to the drive.
Drive Letter
Boot
Syst...
Name
File System
C: Yes C: NTFS
E: E: NTFS
F: F: NTFS
G: G: NTFS
H: H: NTFS
I: I: NTFS
J: J: NTFS
K: K: FAT
L: L: FAT32
M: M: exFAT
Select All
Deselect All
< Back
Next >
Cancel

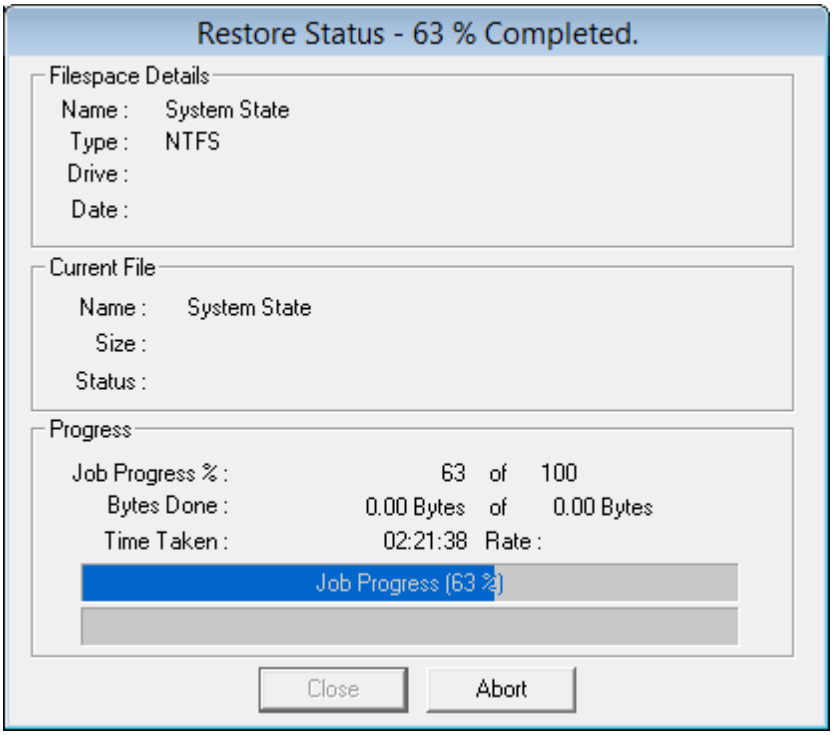
Click Next> to commence the restore of the TSM filespaces to their target disks/partitions.

Finally, a new window appears containing the restore status of recovered files, with progress bars indicating how much of the backup has been restored. This display also shows the recovery statistics in terms of time, size and throughput.

Note that the recovery is divided into different phases: firstly each volume filespace selected is restored with the *SystemState* filespace restored last.



This process may take some minutes if the backups are large. You may select the Abort button to terminate the file recovery process, but this may leave the disk or partition in an unpredictable state, which may render it unusable.



If any errors occur during the recovery, an error message will be shown in the window. Refer to the

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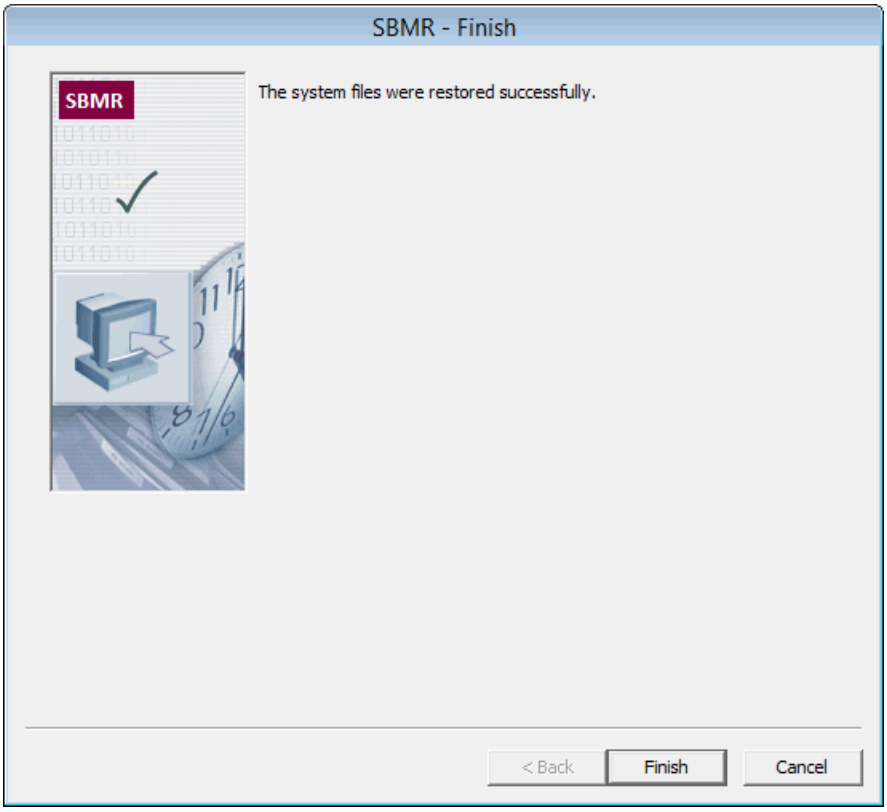
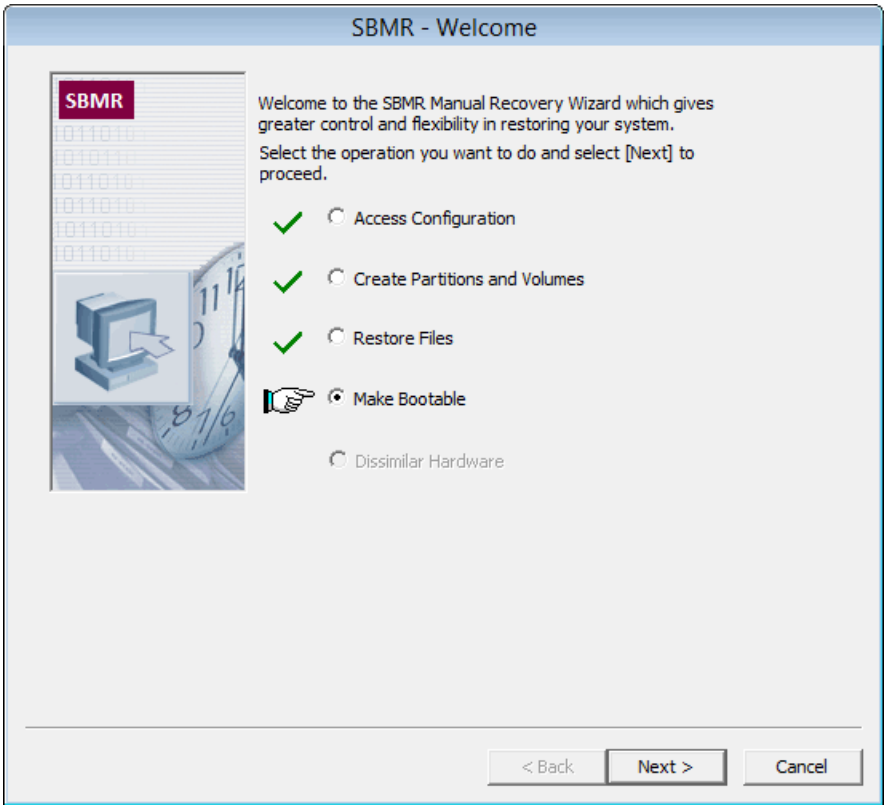
logs post recovery to establish the cause of any error. When the restore files step completes the following dialogue is displayed:



Click Finish and control returns to the next step in the **Manual Recovery** sequence.

7.2.3.4 Make Bootable

The next step in the manual recovery sequence is to make the original disk 'bootable'. This involves re-creating the MBR of the boot disk and modifying the registry with the new disk GUID.


SBMR - Welcome
SBMR
Welcome to the SBMR Manual Recovery Wizard which gives greater control and flexibility in restoring your system.
Select the operation you want to do and select [Next] to proceed.
Access Configuration
Create Partitions and Volumes
Restore Files
Make Bootable
Dissimilar Hardware
< Back
Next >
Cancel

Press Next> to commence the **Make Bootable** step. You will now be able to change the hostname and/or the machine's IP addresses on reboot.

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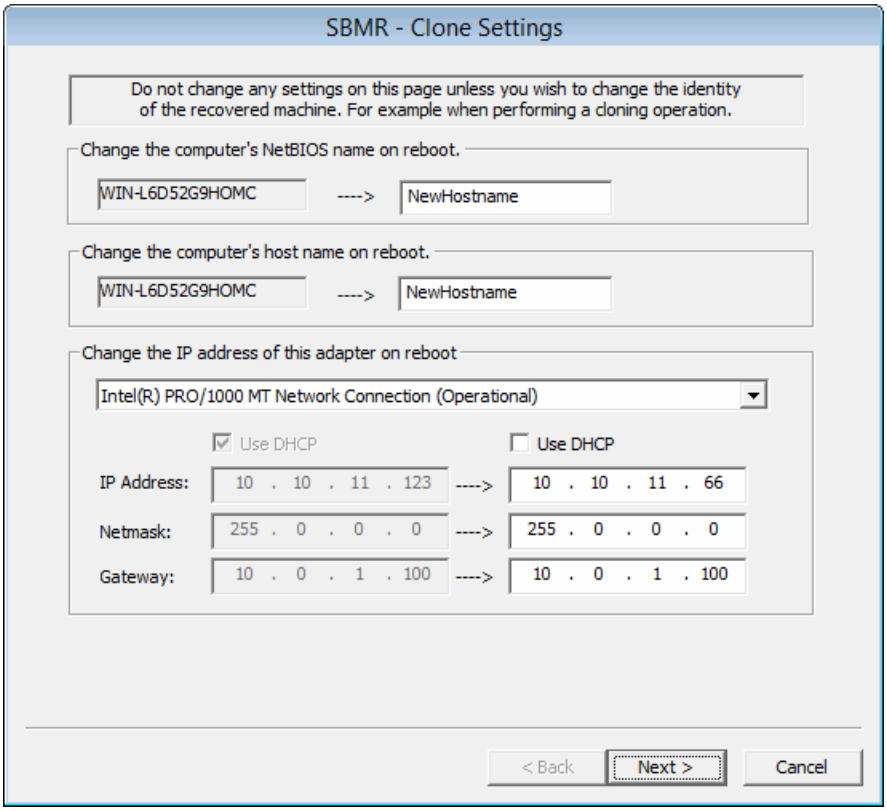
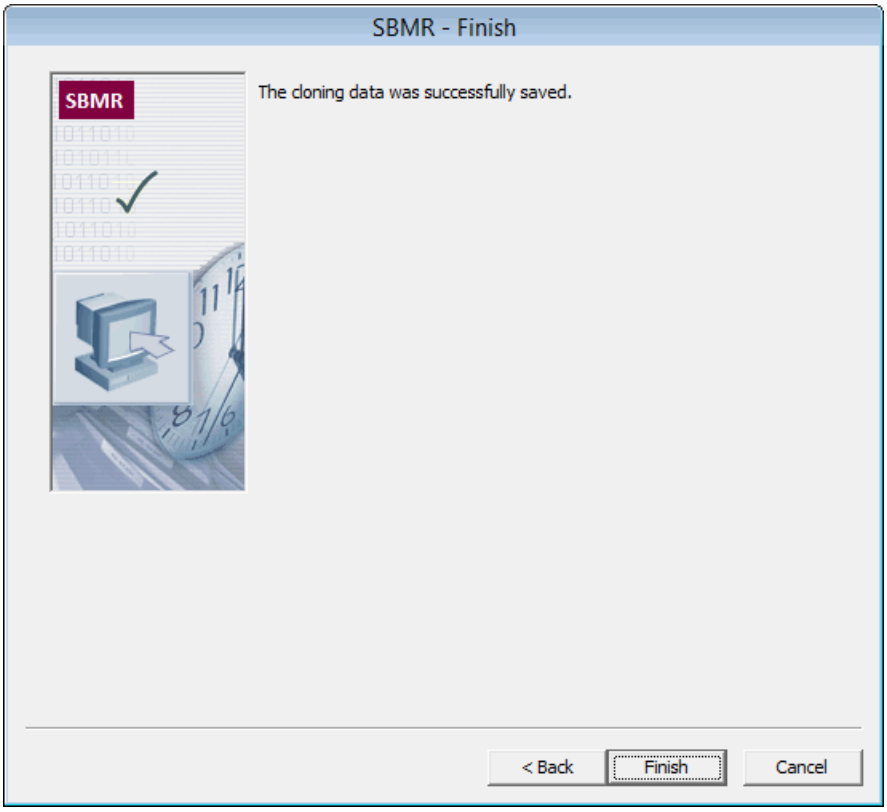
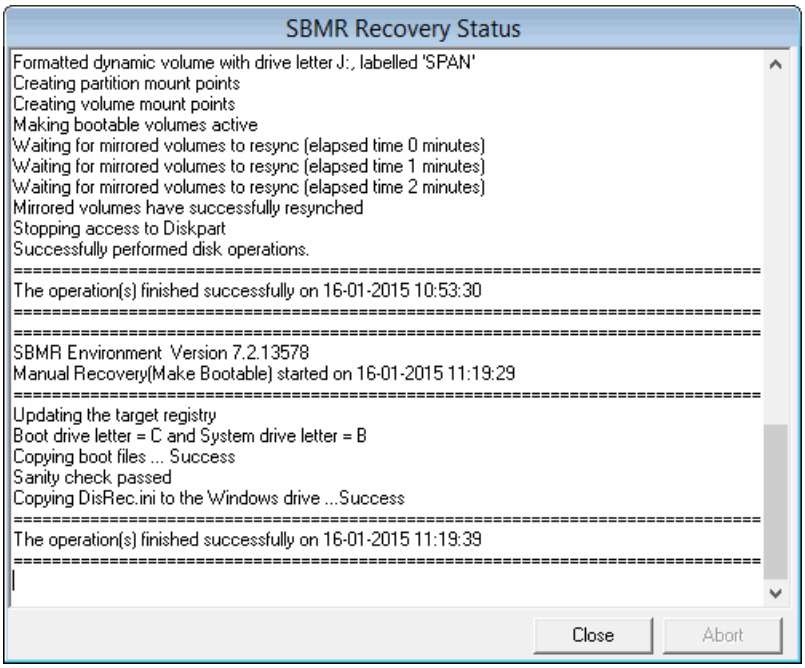

SBMR - Clone Settings
Do not change any settings on this page unless you wish to change the identity of the recovered machine. For example when performing a cloning operation.
Change the computer's NetBIOS name on reboot.
WIN-L6D52G9HOMC
---->
NewHostname
Change the computer's host name on reboot.
WIN-L6D52G9HOMC
---->
NewHostname
Change the IP address of this adapter on reboot
Intel(R) PRO/1000 MT Network Connection (Operational)
Use DHCP
Use DHCP
IP Address:
10 . 10 . 11 . 123
---->
10 . 10 . 11 . 66
Netmask:
255 . 0 . 0 . 0
---->
255 . 0 . 0 . 0
Gateway:
10 . 0 . 1 . 100
---->
10 . 0 . 1 . 100
< Back
Next >
Cancel

If no hostname or IP change is required, click Next> to continue. The cloning data is confirmed with the following dialogue.



Click Finish to complete the Make Bootable step.

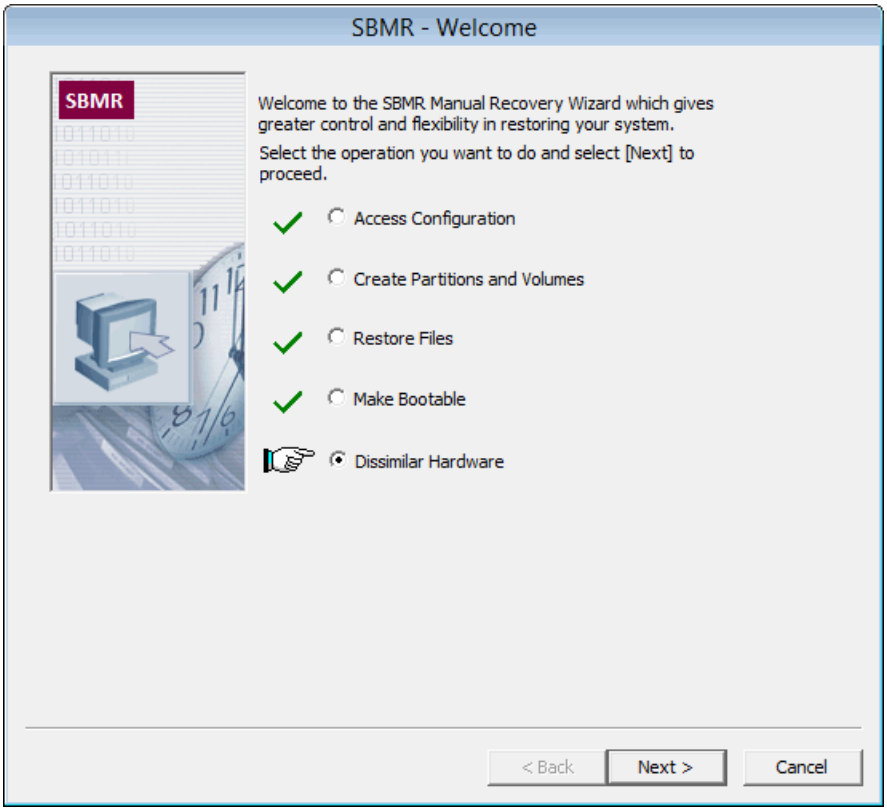
A new dialogue window opens summarising the success or failure of the operation:


SBMR Recovery Status
Formatted dynamic volume with drive letter J:, labelled 'SPAN'
Creating partition mount points
Creating volume mount points
Making bootable volumes active
Waiting for mirrored volumes to resync (elapsed time 0 minutes)
Waiting for mirrored volumes to resync (elapsed time 1 minutes)
Waiting for mirrored volumes to resync (elapsed time 2 minutes)
Mirrored volumes have successfully resynched
Stopping access to Diskpart
Successfully performed disk operations.
The operation(s) finished successfully on 16-01-2015 10:53:30
SBMR Environment Version 7.2.13578
Manual Recovery(Make Bootable) started on 16-01-2015 11:19:29
Updating the target registry
Boot drive letter = C and System drive letter = B
Copying boot files ... Success
Sanity check passed
Copying DisRec.ini to the Windows drive ...Success
The operation(s) finished successfully on 16-01-2015 11:19:39
Close
Abort

Press Close to complete the step and return to the **Manual Recovery Wizard**.

7.2.3.5 Dissimilar Hardware

The final step in the manual DR sequence is to check if the recovery is to **Dissimilar Hardware**.


SBMR - Welcome
SBMR
Welcome to the SBMR Manual Recovery Wizard which gives greater control and flexibility in restoring your system.
Select the operation you want to do and select [Next] to proceed.
Access Configuration
Create Partitions and Volumes
Restore Files
Make Bootable
Dissimilar Hardware
< Back
Next >
Cancel

This is determined by comparing the drivers currently in use by Windows WinPE 5 and the drivers listed in the recovered machine's registry.

The step first prompts for what driver types should be checked. By default, only **Mass Storage** (disk) and **network devices** are checked.

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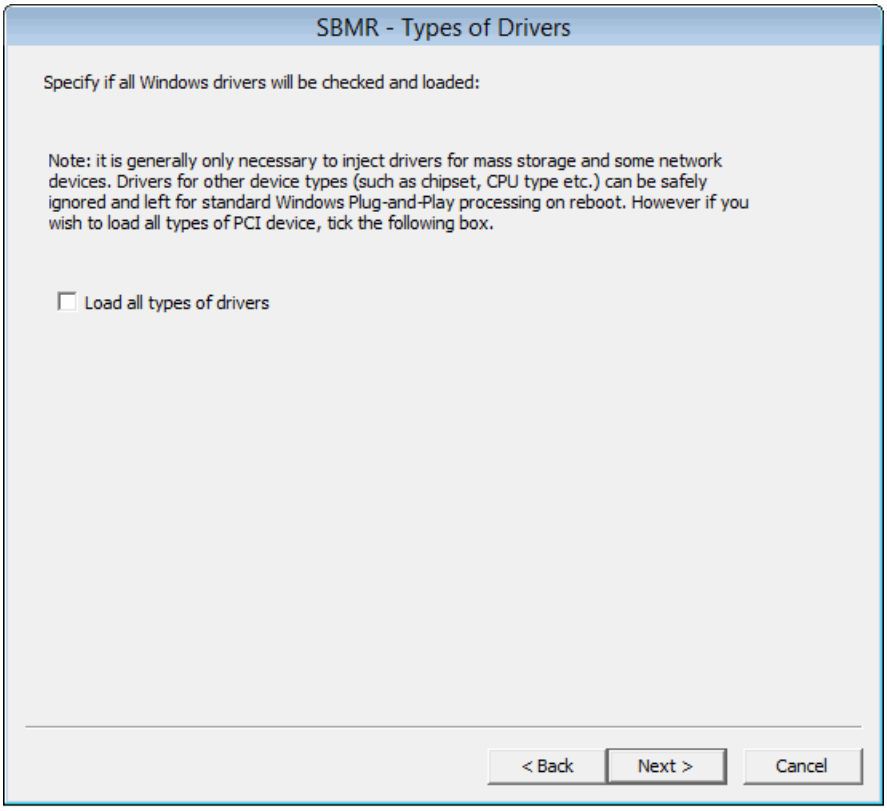
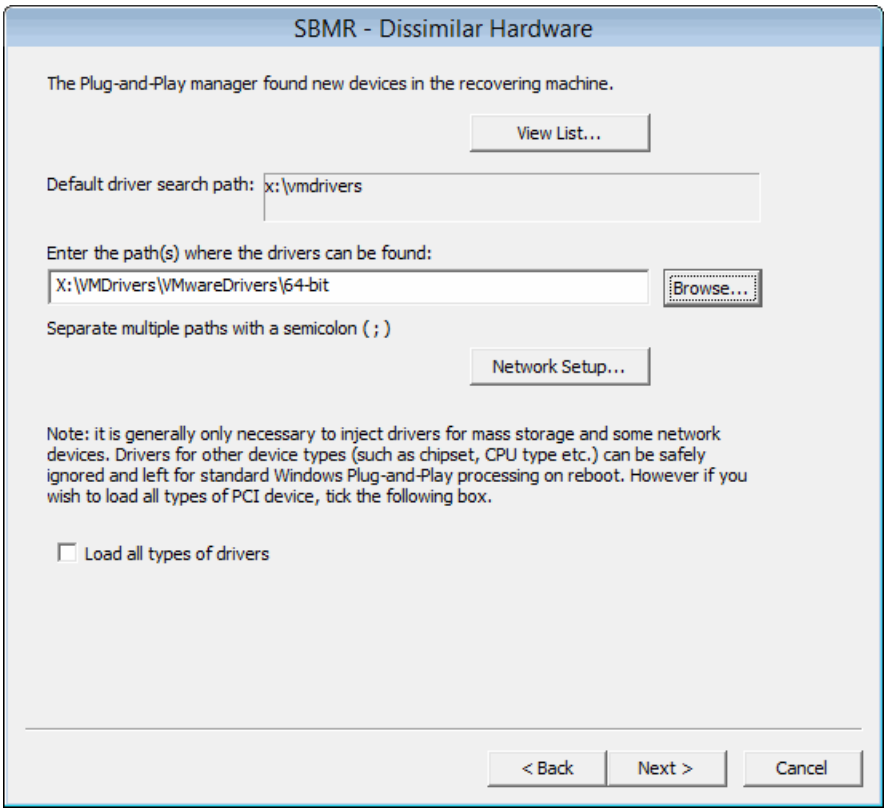
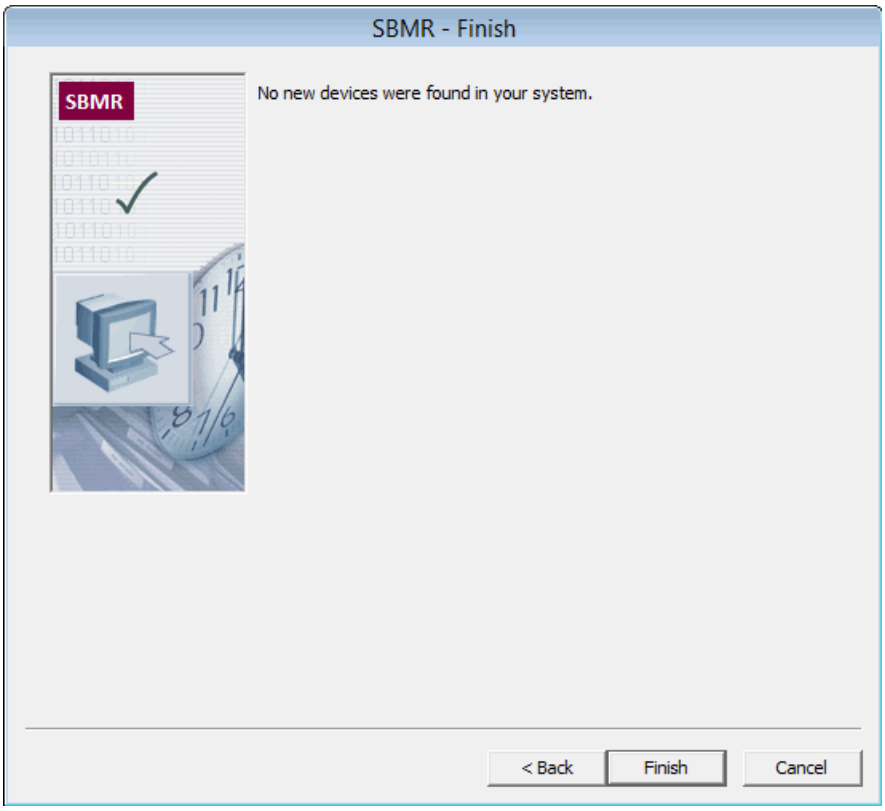

SBMR - Types of Drivers
Specify if all Windows drivers will be checked and loaded:
Note: it is generally only necessary to inject drivers for mass storage and some network devices. Drivers for other device types (such as chipset, CPU type etc.) can be safely ignored and left for standard Windows Plug-and-Play processing on reboot. However if you wish to load all types of PCI device, tick the following box.
Load all types of drivers
< Back
Next >
Cancel

Click Next> to continue.

If new devices are detected then you will be prompted for the location containing drivers for the new devices:


SBMR - Dissimilar Hardware
The Plug-and-Play manager found new devices in the recovering machine.
View List...
Default driver search path:
x:\vmdrivers
Enter the path(s) where the drivers can be found:
X:\VMDrivers\VMwareDrivers\64-bit
Browse...
Separate multiple paths with a semicolon (;)
Network Setup...
Note: it is generally only necessary to inject drivers for mass storage and some network devices. Drivers for other device types (such as chipset, CPU type etc.) can be safely ignored and left for standard Windows Plug-and-Play processing on reboot. However if you wish to load all types of PCI device, tick the following box.
Load all types of drivers
< Back
Next >
Cancel

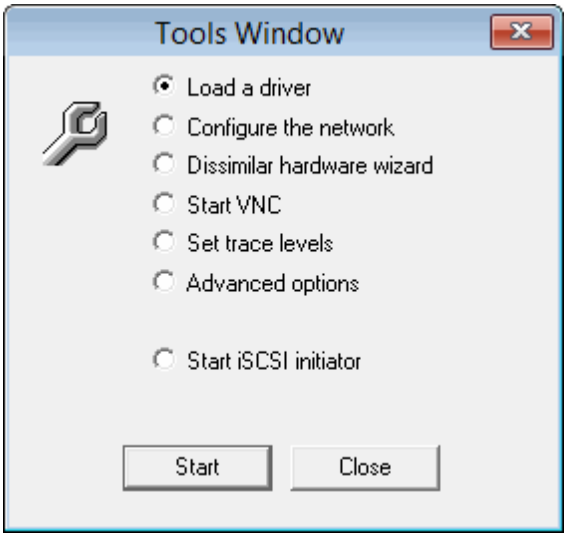
However, for recovery to similar hardware, no new devices will be found and this will be confirmed by this dialogue:



Click Finish to complete the manual recovery sequence. At this point control returns to the Recovery Environment menu. At this point save the restore logs to a suitable network share and select **Reboot** to boot the recovered machine.

7.2.4 Tools

There are a number of tools that can assist with the recovery process. They are all collected under this command button:



The options available are:

- Load a driver

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- Configure the network
- Dissimilar Hardware Wizard
- Start VNC
- Set trace levels
- Advanced options
- Start iSCSI initiator

Load a driver allows a new mass storage or NIC driver to be injected into the running booted WinPE 5 DR environment. This would be used, for example, to support a mass-storage (disk) device not currently supported out-of-box. This should be done prior to starting the DR sequence.

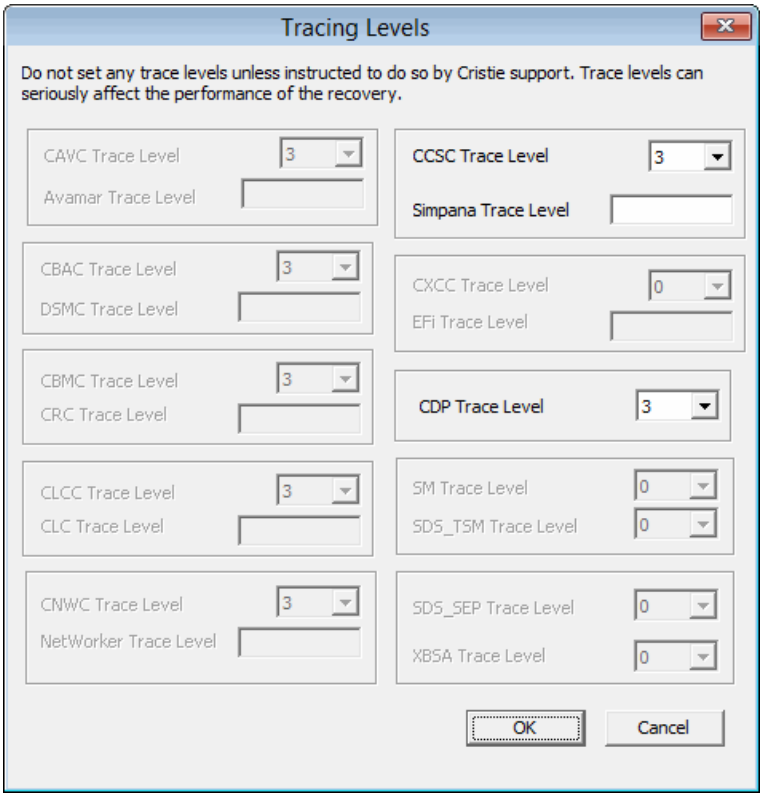
Selecting **Configure the network** will start the **Cristie Network Configurator** tool. This provides extensive facilities to configure networks during the DR process.

The **Dissimilar Hardware Wizard** will allow drivers to be injected into the recovered system when the target hardware has different devices from the original (eg. RAID controllers). Normally, this will be done automatically as part of the DR sequence and will not need to be run manually.

Start VNC will run a VNC server within the WinPE 5 environment, allowing external VNC clients to remotely connect during the DR session. The start process will provide you with the current IP address of the WinPE 5 environment, which you will need to specify in the VNC client.

> ***Note: the VNC connection is also password protected. The VNC feature is intended for diagnosing DR problems under the guidance of Cristie Support, who will provide the password upon request.***

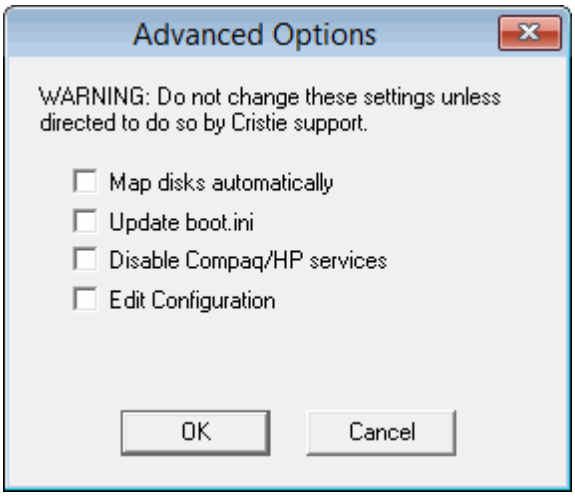
Set trace levels allows the DR log file trace to be increased or decreased as required:



It is recommended that the trace levels are only changed when advised to do so by Cristie Support

staff. This is because they could have a severe impact upon the performance of the backup restore process.

Advanced Options should only be selected when advised to do so by Cristie Support staff.



Start iSCSI initiator - please contact Cristie Support if you wish to use this feature.

7.2.4.1 Cristie Network Configurator Tool

The **Cristie Network Configurator** tool provides extensive facilities to configure the network during the recovery process. It offers the following features:

- supports multiple NICs
- configure individual NIC parameters for duplex mode and link speed
- the ability to select DHCP allocated or static IP addresses
- the ability to setup DNS server IP addresses
- the ability to setup the Network Identification of the recovering system
- allow file shares to be set on the recovering system
- map/unmap network drives

Select the

button at the top of the dialogue to show Network Configurator online help.

Configure NIC Parameters

It is possible to change both the link speed and duplex mode for any NIC detected on the recovering target system. Select the desired NIC (there could be more than one) from the drop down box and then select Update....

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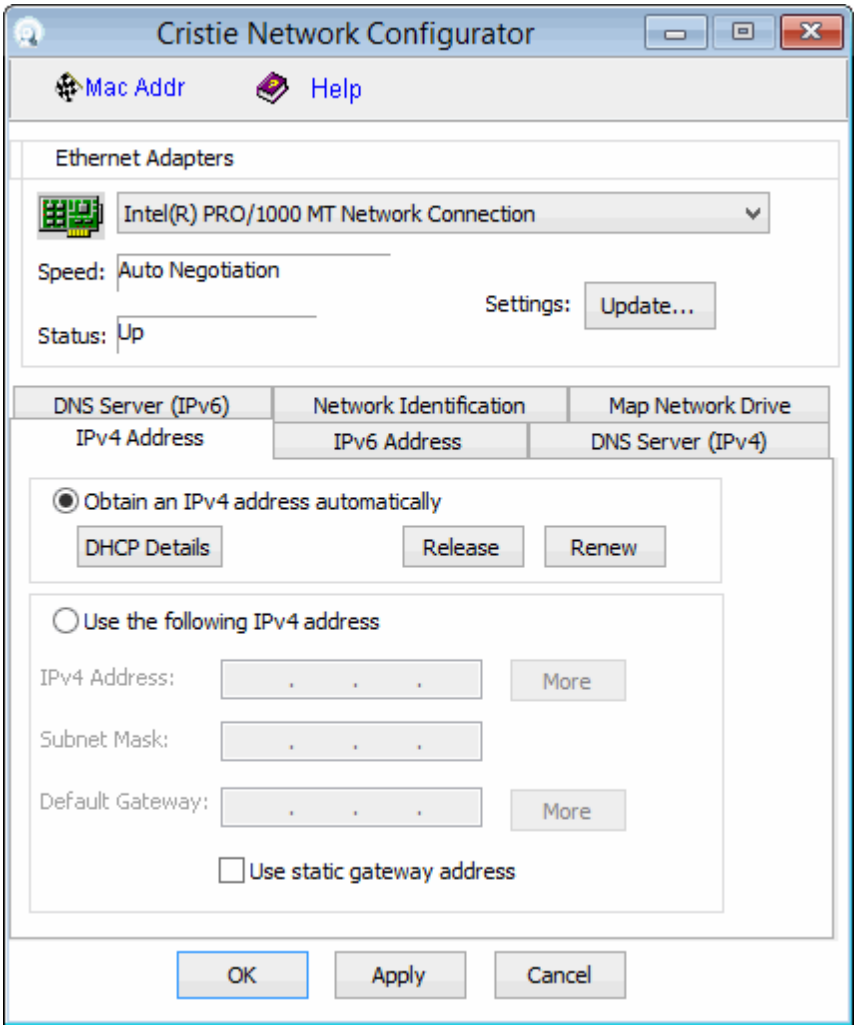
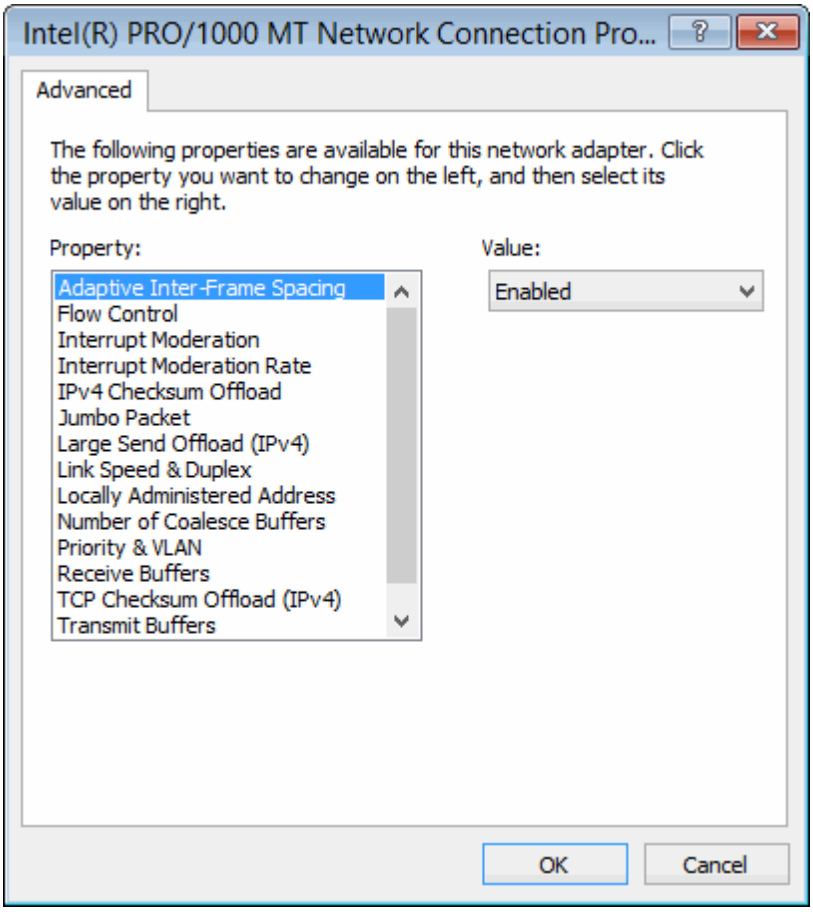


The resulting display offers numerous NIC properties that can be changed. This property list is dependent upon the NIC - ie. not all properties will be available for all NICs.



To change the NIC speed or duplex setting, select the corresponding *Property* from the dialogue and then select the required value from the *Value* drop down box as shown below:

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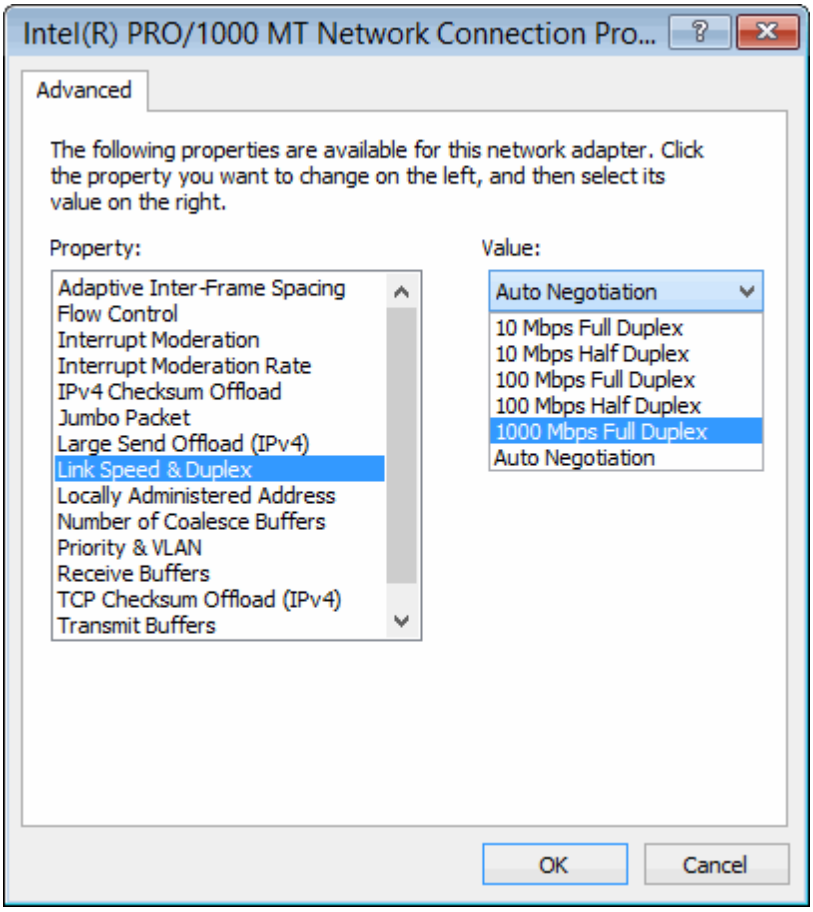


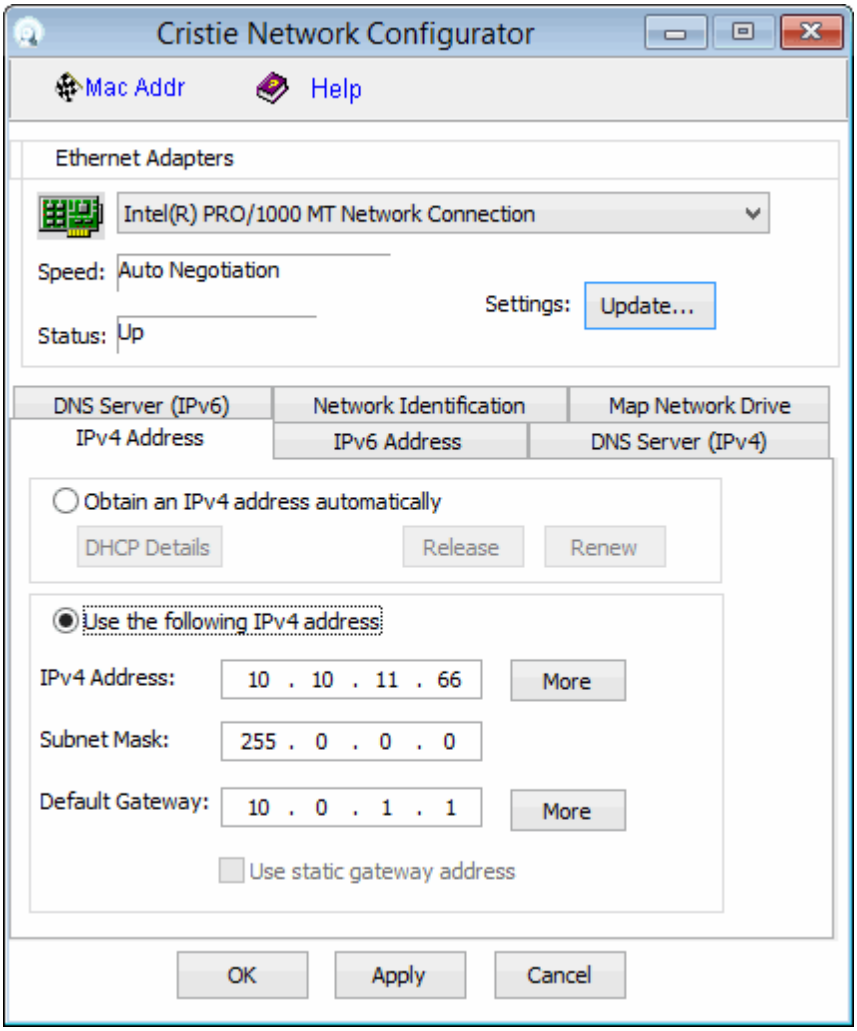
Again, note that the speed/duplex settings available are NIC dependent. *Auto Negotiation* is generally the NIC default setting. Other NIC properties may be changed as required.

If the NIC is currently connected to the network then the *Status* will be shown as **Operational**. Otherwise the NIC is considered to be **Non-Operational**.

Assign Static or DHCP IP Settings

Normally the WinPE 5 DR environment will start with DHCP enabled and active. However, if a static IP is required, use the 'Use the following IP address' option to manually configure.

First ensure the desired network adapter is selected from the drop down list. If a static IP address is to be applied, select the 'Use the following IP address' button. This will automatically deselect the default DHCP option and allow the static IP parameters to be defined.



Set the new IP address, subnet mask and gateway IP address. The More button will allow the system to have more than one static IP address. Click on Apply to confirm the settings for the selected adapter.

This feature will also allow the DHCP lease to be released or renewed, as required.

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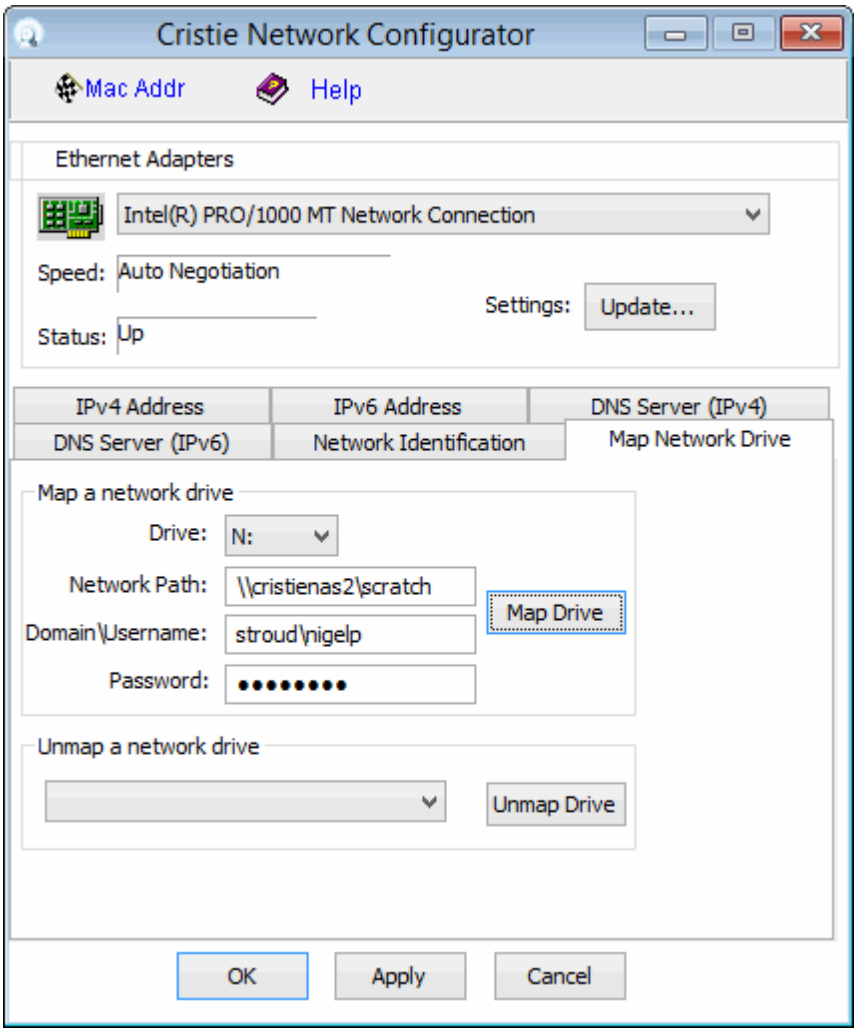
Map a Network Drive

In order to simplify access to network resources, the Network Configurator allows you to map a network drive to a network share. Start the Cristie Network Configurator from the **Tools** menu and select the **Map Network Drive** tab.

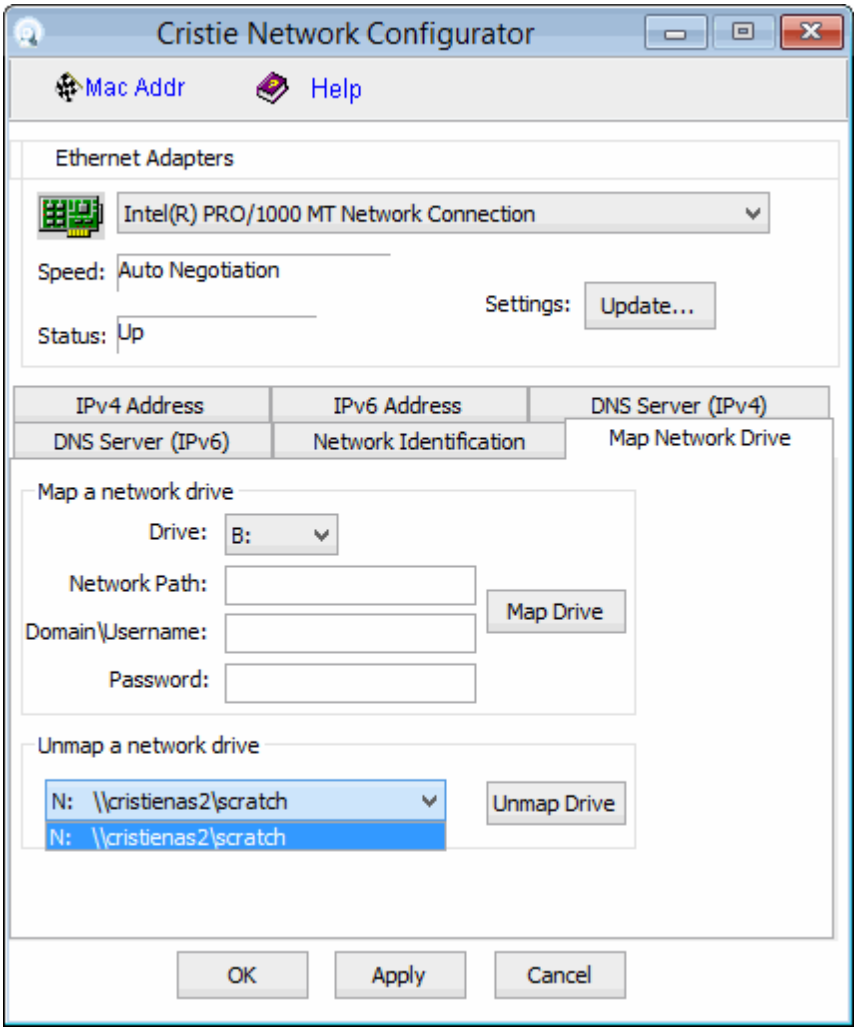


Select the drive letter that you wish to allocate from the **Drive** drop-down box and type in the share name that you wish to associate with it. Also specify the network credentials to be used to access the share.

Press Map Drive to confirm the share operation. If successful, the share will be added to the **Unmap a network drive** drop down list.

Unmap a Network Drive

If you need to disconnect a mapped drive for any reason, this option allows you to do this. Just select the drive that you wish to disconnect from the Unmap a network drive drop down list and then click Unmap Drive.



The mapped drive is removed from the list to confirm the operation.

Setup DNS Servers

DNS server IP addresses are automatically set when the WinPE 5 DR environment boots. However, options are provided to allow DNS server IP addresses to be manually set if required.

> ***Note: WINS servers are not currently supported by this tool.***

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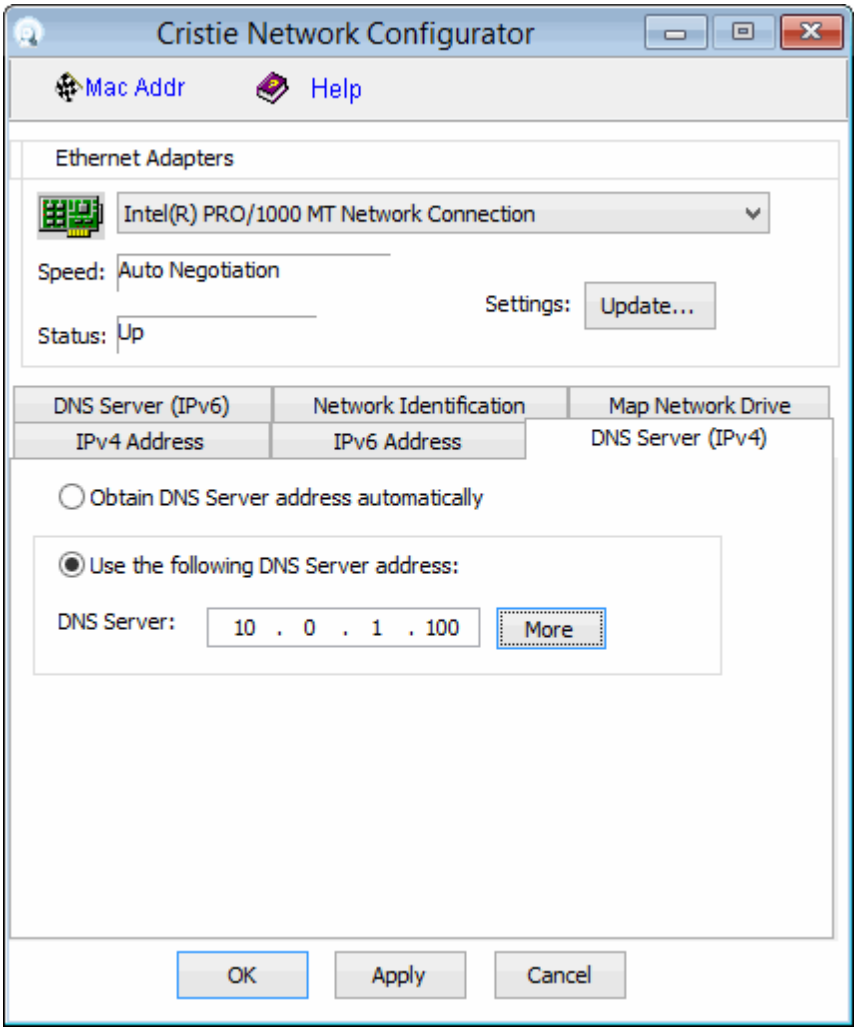
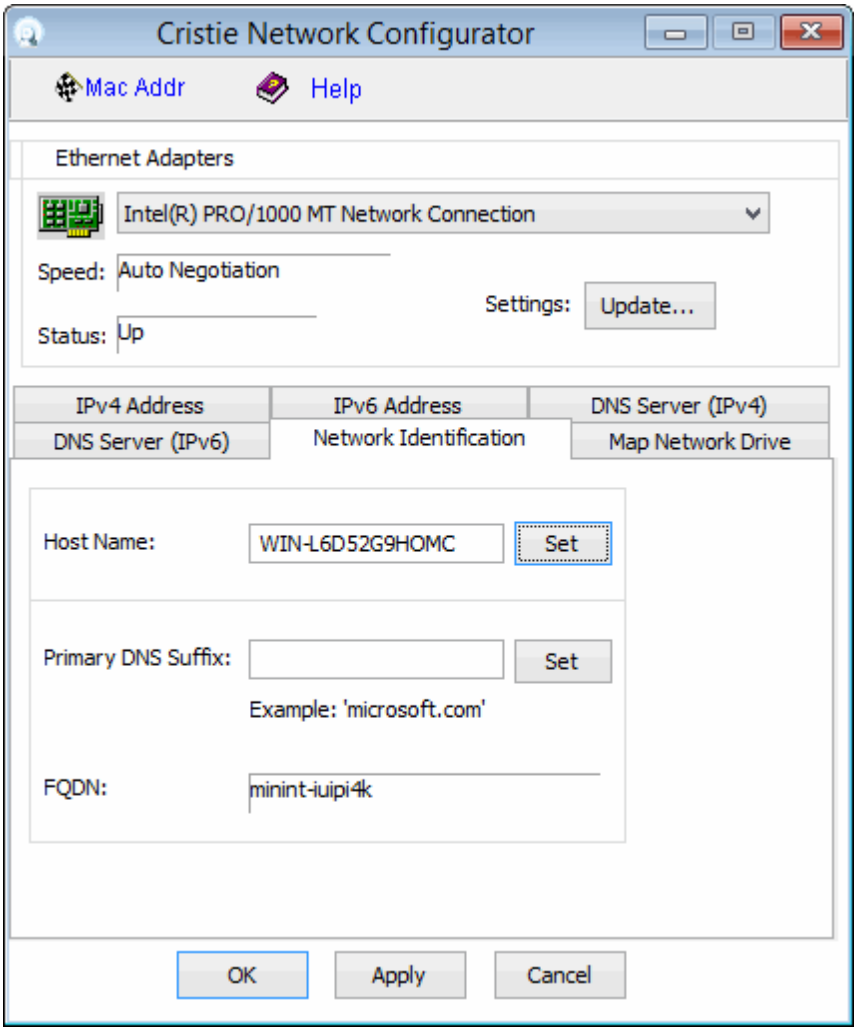


Select the **'Use the following DNS Server address'** radio button and enter the new DNS IP server address. If required, select the More button to add several DNS IP addresses. Press Apply to activate the new address.

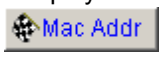
Setup Network Identification

Click the **Network Identification** tab to setup a new hostname for the recovering system. This allows the WinPE 5 hostname and Primary DNS suffix to be changed during a DR session if required. These details are transient and only apply only while theWinPE 5 DR session is running. They are not applied to the recovered system when it reboots after the DR session.



Enter the new Computer Name and press Set to confirm the change.

Display/Change MAC Address

It is possible to display and change the local MAC address of the recovering system. Select the MAC Address 

button at the top of the Main menu dialogue:

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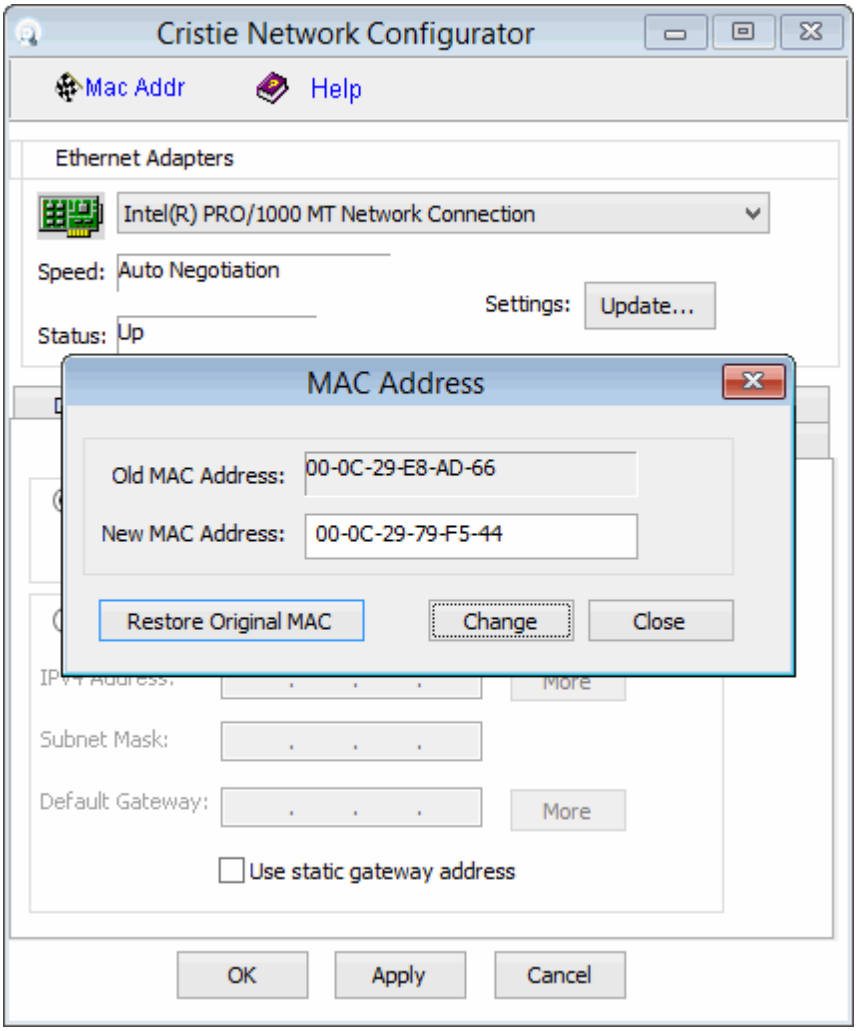


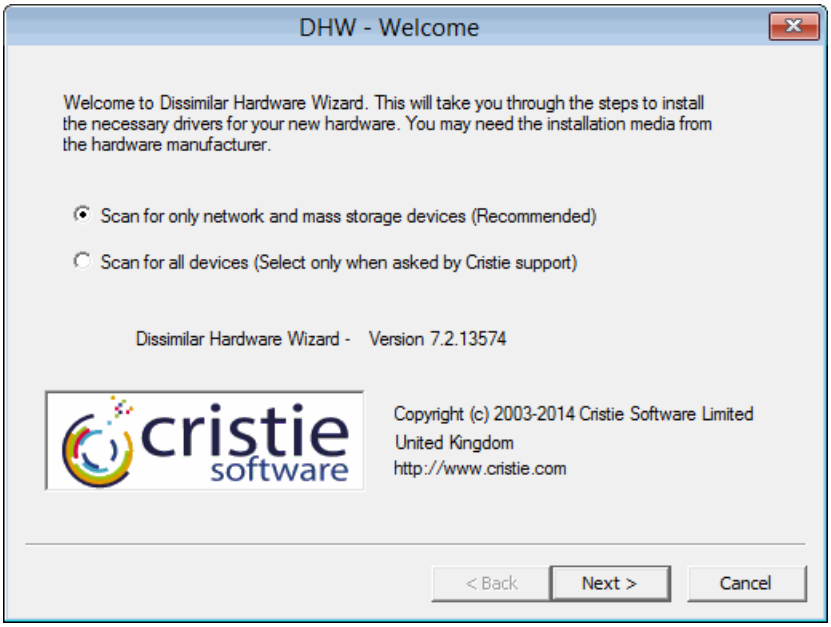
Change the MAC address by entering a new value in the form xx-xx-xx-xx-xx-xx and selecting Change. The original MAC address will be preserved and can be restored using the Restore Original MAC button.

7.2.4.2 Dissimilar Hardware Wizard

A restore to dissimilar hardware is normally detected during the Automatic or Manual DR sequence. Drivers will be injected automatically at the end of the restore sequence if a source location has been provided. However, if this process has failed for some reason, or additional drivers are required to be injected into the recovering machine, then this **Dissimilar Hardware Wizard** (DHW) tool is provided.

> ***Note: it is only necessary to load the drivers for the hard disk, NIC and, rarely, the HAL. Drivers for the hard disks and NIC can be determined by Plug-and-Play (PnP) and may be readily identified. However, changes required in the CPU model via a change in HAL cannot yet be determined by PnP - these need to be loaded manually.***

If you wish to scan for just Mass Storage and Network devices (the minimum required to boot a dissimilar system), select Next> to continue to the next step of the Wizard. This is the recommended option. Under the guidance of **Cristie Support**, you may be asked to scan for all devices. In this case, tick the **'Scan for all devices'** box before selecting Next>.


DHW - Welcome
Welcome to Dissimilar Hardware Wizard. This will take you through the steps to install the necessary drivers for your new hardware. You may need the installation media from the hardware manufacturer.
Scan for only network and mass storage devices (Recommended)
Scan for all devices (Select only when asked by Cristie support)
Dissimilar Hardware Wizard - Version 7.2.13574
cristie software
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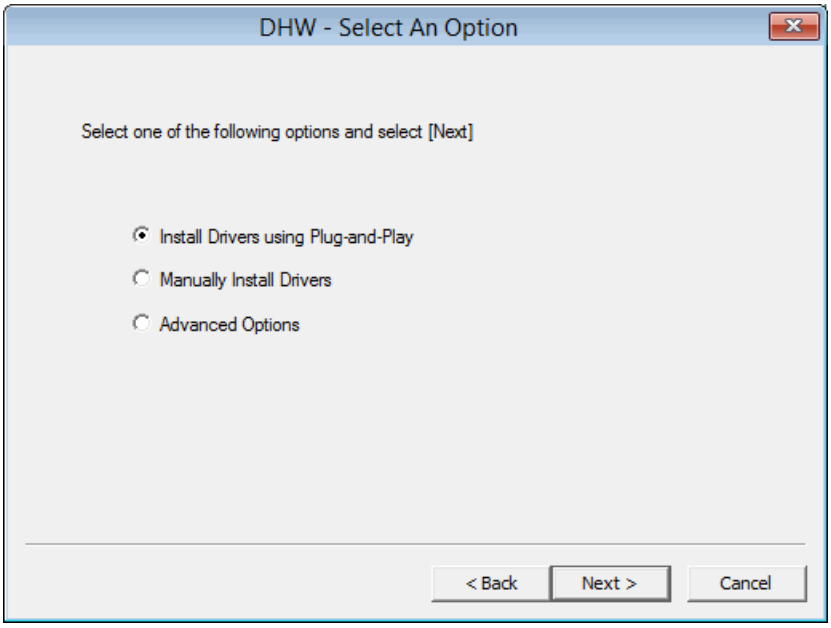
United Kingdom
http://www.cristie.com
< Back
Next >
Cancel

Select the **'Install Drivers using Plug-and-Play'** option:


DHW - Select An Option
Select one of the following options and select [Next]
Install Drivers using Plug-and-Play
Manually Install Drivers
Advanced Options
< Back
Next >
Cancel

Install Drivers using Plug-and-Play

The window appears empty to start with. The set of drivers located on the recovery CD is the default choice, but in practice they should not be used. Instead, change the driver search path to where you have actually located your drivers (for example, to a network share or another CD) with the **Change** command button.

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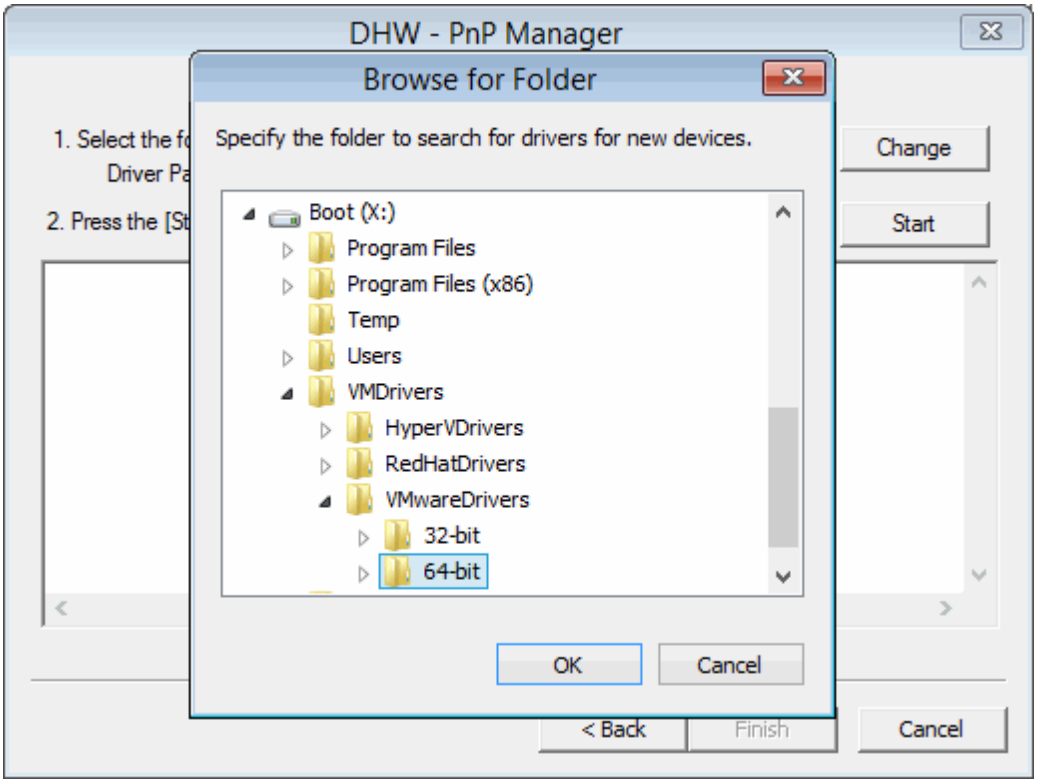
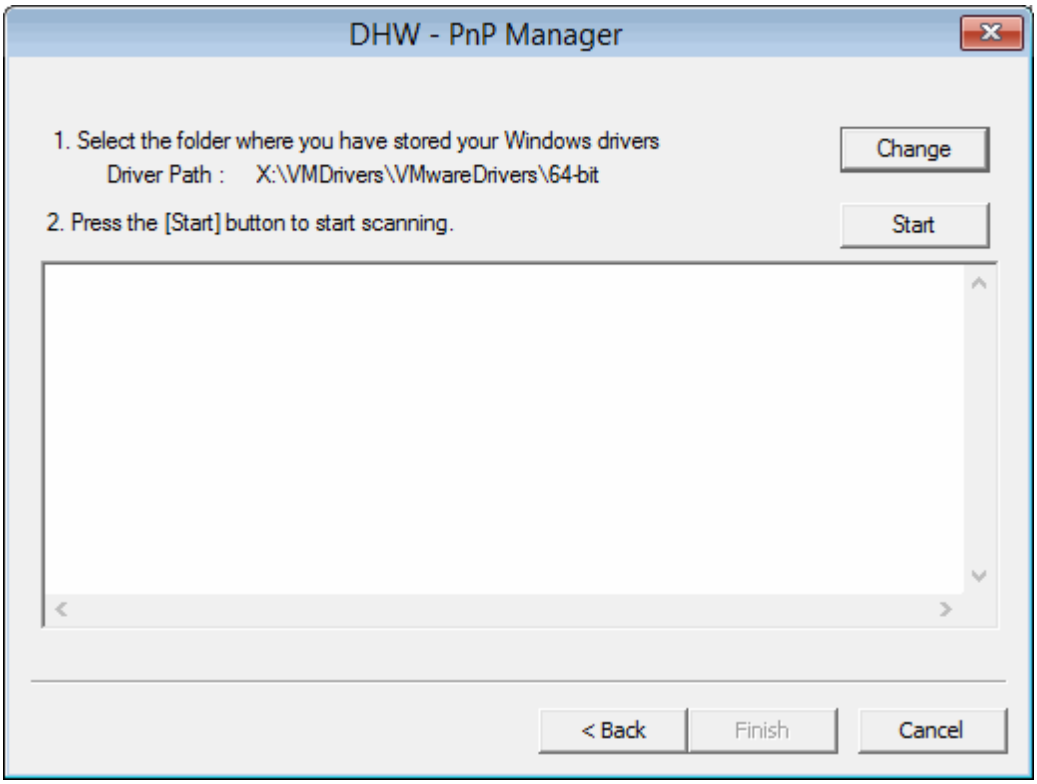
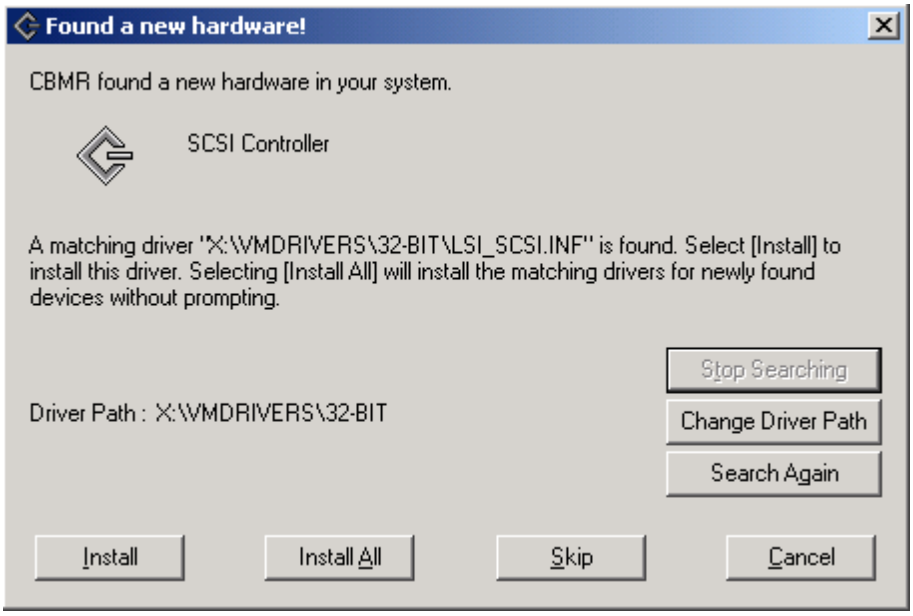


In the example above, the driver search path is changed to the VMware drivers on the WinPE boot CD. Begin the PnP driver detection by clicking Start.



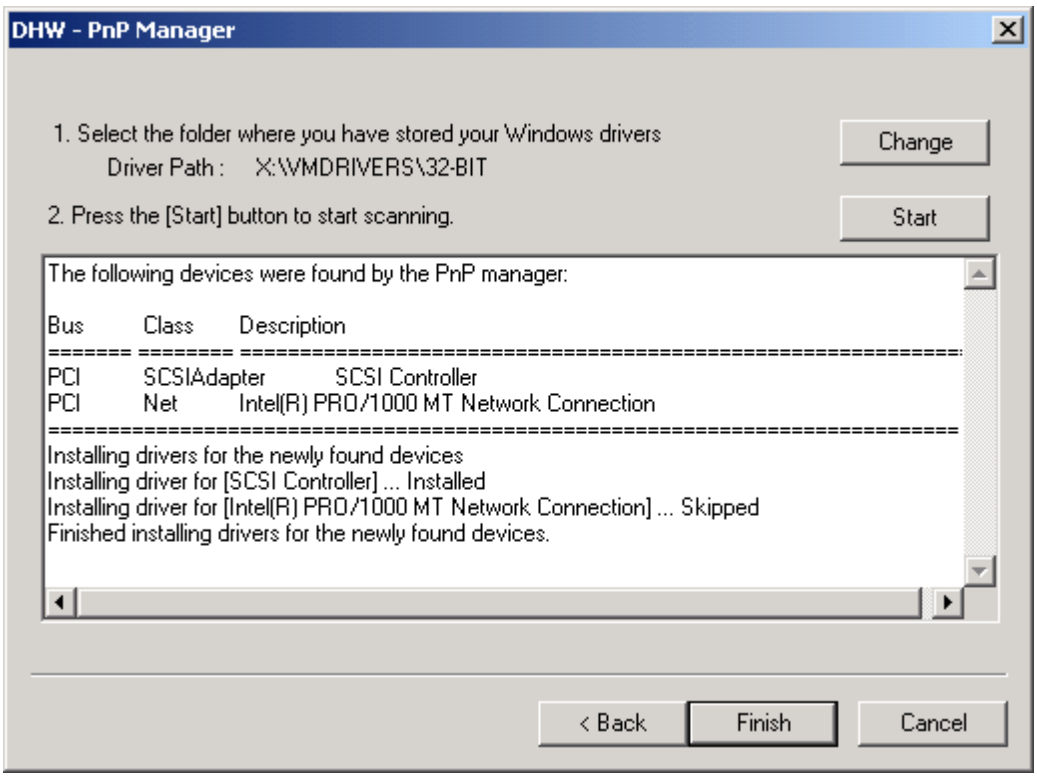
The process checks the devices that it can detect and when it finds one that does not have a driver loaded, it will offer to install it. The example below shows an LSI SCSI device being detected:


Found a new hardware!
CBMR found a new hardware in your system.
SCSI Controller
A matching driver "X:\VMDRIVERS\32-BIT\LSI_SCSI.INF" is found. Select [Install] to install this driver. Selecting [Install All] will install the matching drivers for newly found devices without prompting.
Stop Searching
Driver Path : X:\VMDRIVERS\32-BIT
Change Driver Path
Search Again
Install
Install All
Skip
Cancel

If you are satisfied that the found driver path is correct, click on Install and the driver will be installed. The device scan will continue and may find, for example, other mass storage or network devices. Follow the steps above to install.

Drivers are usually .sys files. The .inf files define which driver files need to be loaded for a given device. You may need to confirm the location of the driver files for each device, or possibly find the path where they are stored. When you have the correct path, click on OK and the Wizard will look for more.

Once all of the drivers of the detected devices have been processed, the Wizard will indicate that the installation has finished. Click on Finish to proceed.


DHW - PnP Manager
1. Select the folder where you have stored your Windows drivers
Driver Path : X:\VMDRIVERS\32-BIT
Change
2. Press the [Start] button to start scanning.
Start
The following devices were found by the PnP manager:
Bus Class Description
PCI SCSIAdapter SCSI Controller
PCI Net Intel(R) PRO/1000 MT Network Connection
Installing drivers for the newly found devices
Installing driver for [SCSI Controller] ... Installed
Installing driver for [Intel(R) PRO/1000 MT Network Connection] ... Skipped
Finished installing drivers for the newly found devices.
< Back
Finish
Cancel

Manual Installation

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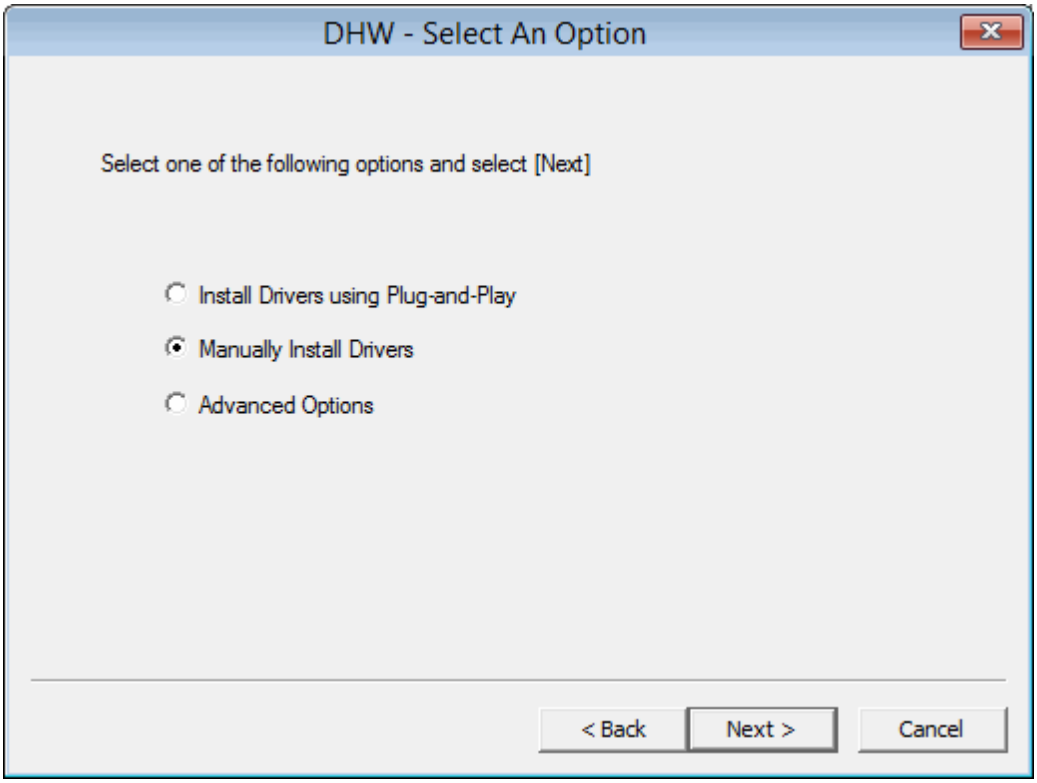
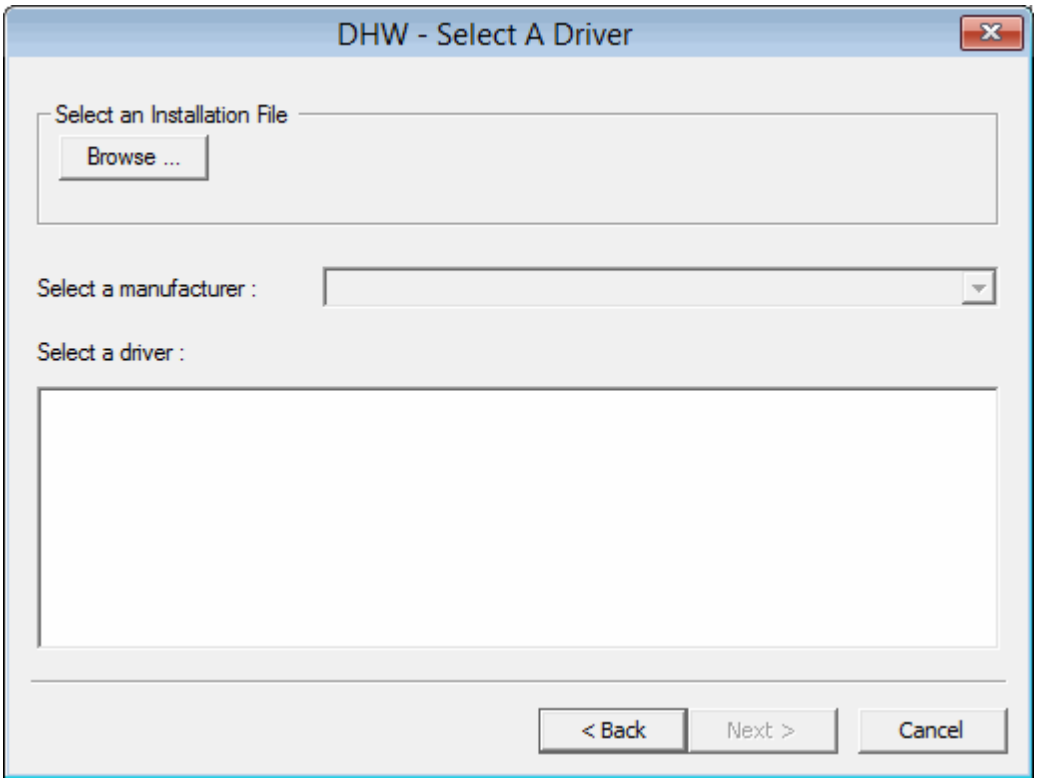
Typically, you would only manually install a driver for a CPU/HAL change. Select **'Manually Install Drivers'** from the option menu:

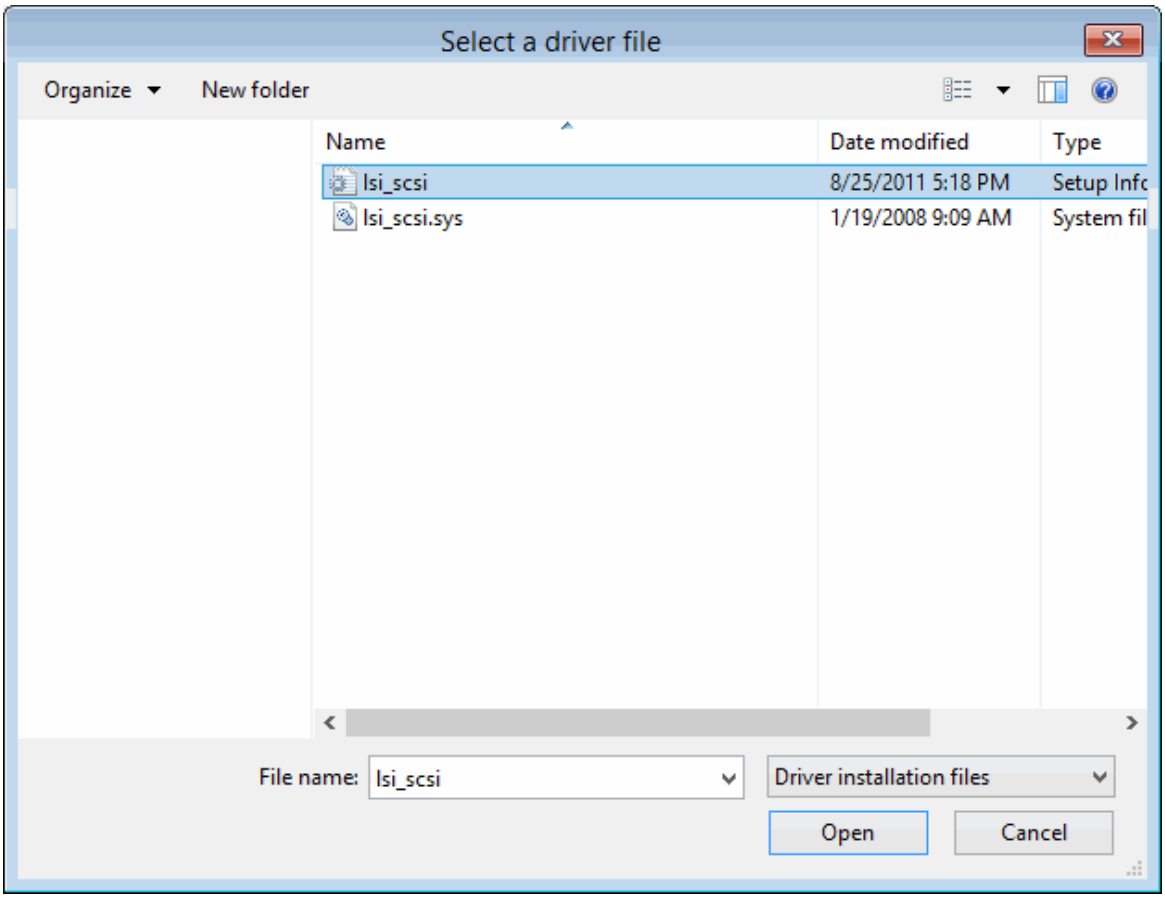

DHW - Select An Option
Select one of the following options and select [Next]
Install Drivers using Plug-and-Play
Manually Install Drivers
Advanced Options
< Back
Next >
Cancel

Then select Next>.

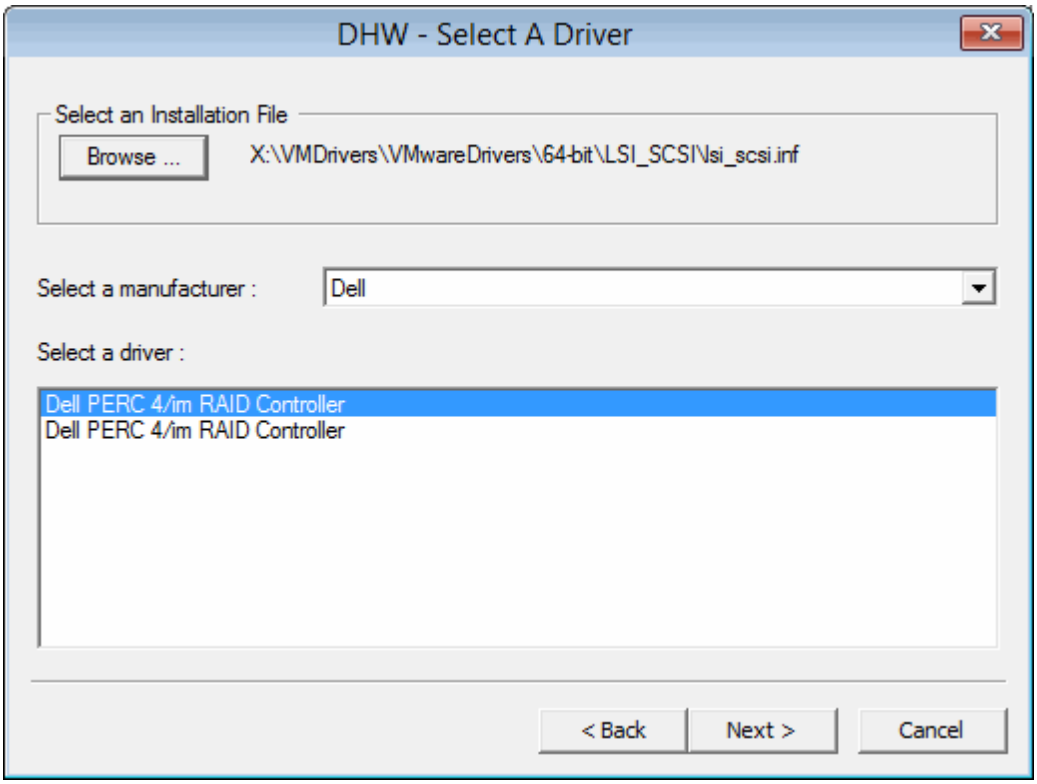


Select Browse... to locate the driver or HAL file you need by browsing to the appropriate folder that

holds the .inf file. If you need to load the driver from another machine, then you can browse to a share on that machine and then to the appropriate folder.



Here we are selecting the Citrix PV SCSI controller driver:



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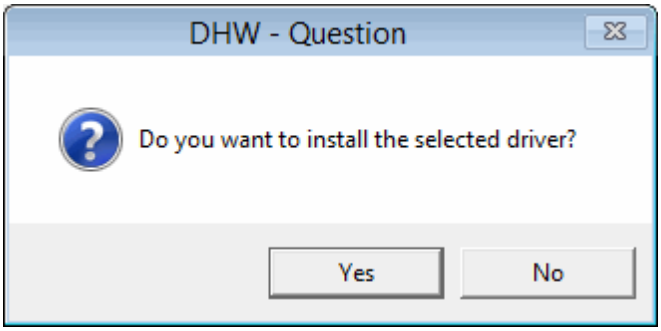
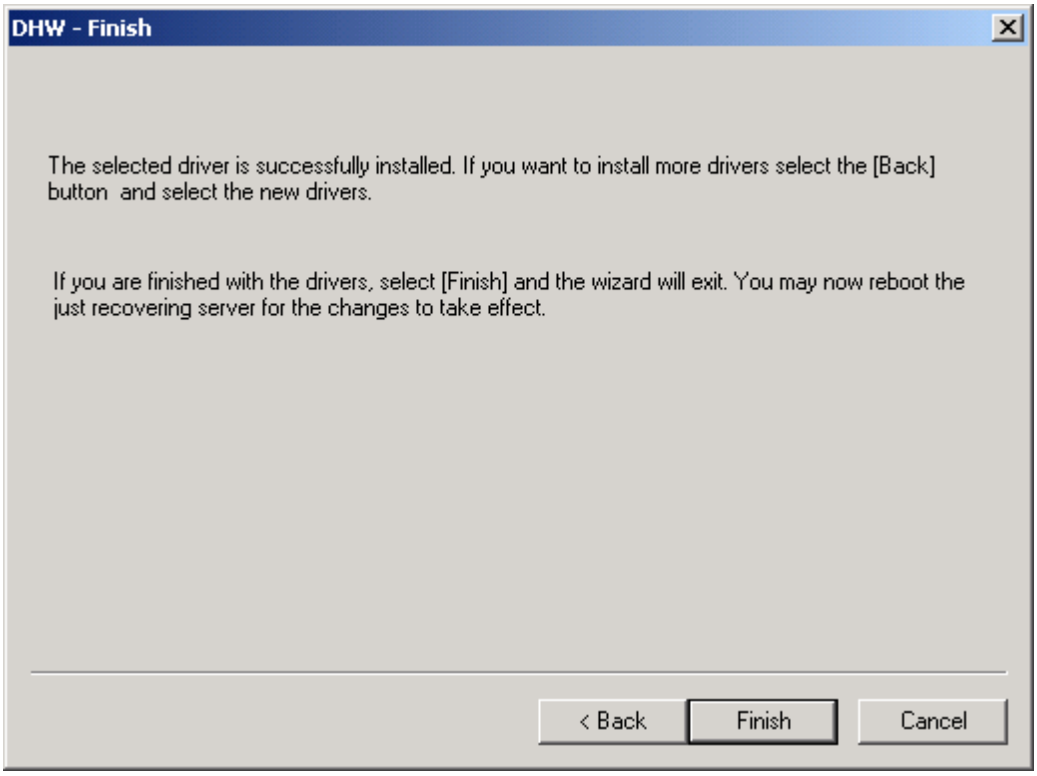
The Wizard allows you to select drivers that are grouped by manufacturer. Select the actual driver that you wish to install and click Next>.



After you confirm the selection, the Wizard determines which files need to be installed. You are given the opportunity to change the location from which they are loaded if required..

When the drivers have been installed, the Wizard allows you to go back to install another device driver or Finish the process.

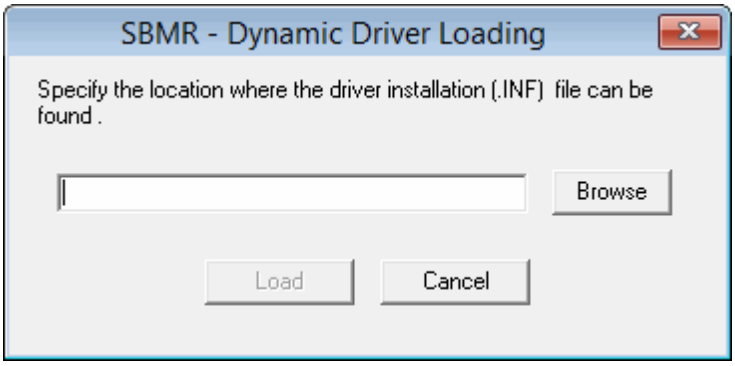

DHW - Finish
The selected driver is successfully installed. If you want to install more drivers select the [Back] button and select the new drivers.
If you are finished with the drivers, select [Finish] and the wizard will exit. You may now reboot the just recovering server for the changes to take effect.
< Back
Finish
Cancel

7.2.4.3 Load a driver

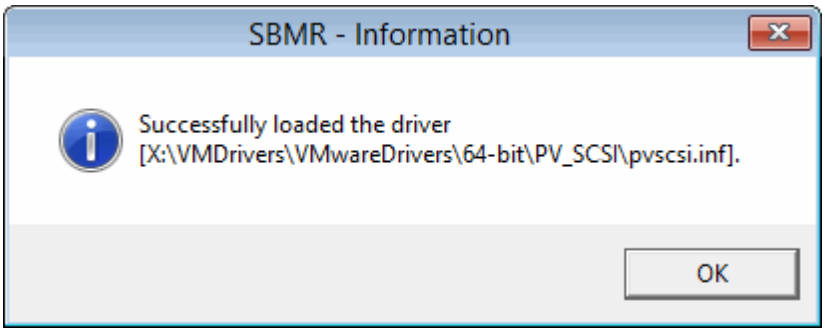
This option allows a **new mass storage** or **Network card driver** to be loaded into the WinPE 5 environment. Use this when WinPE 5 does not have a built-in driver for your hardware.

For example, if the DR environment does not show any disks to be recovered, you can inject a new mass storage device driver for the device and retry the DR Wizard.

You will be prompted for the location of the driver INF file:

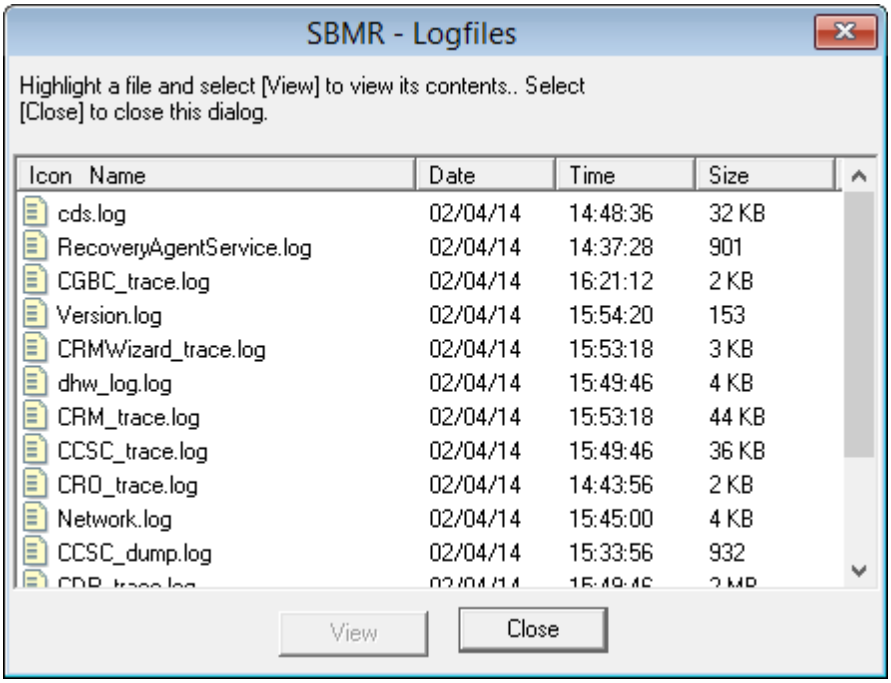

SBMR - Dynamic Driver Loading
Specify the location where the driver installation (.INF) file can be found .
Browse
Load
Cancel

The INF file and other associated driver files (such as the .SYS file) can be located on a CD, USB device or a network share. The following confirmation dialogue is displayed if the driver is loaded successfully:



7.2.5 Show a list of log files for viewing

This main menu option allows the log files produced during the recovery to be viewed using Notepad. Normally, viewing this information is only required to diagnose a problem with the recovery.


SBMR - Logfiles
Highlight a file and select [View] to view its contents.. Select [Close] to close this dialog.
Icon Name
Date
Time
Size
cds.log 02/04/14 14:48:36 32 KB
RecoveryAgentService.log 02/04/14 14:37:28 901
CGBC_trace.log 02/04/14 16:21:12 2 KB
Version.log 02/04/14 15:54:20 153
CRMWizard_trace.log 02/04/14 15:53:18 3 KB
dhw_log.log 02/04/14 15:49:46 4 KB
CRM_trace.log 02/04/14 15:53:18 44 KB
CCSC_trace.log 02/04/14 15:49:46 36 KB
CRO_trace.log 02/04/14 14:43:56 2 KB
Network.log 02/04/14 15:45:00 4 KB
CCSC_dump.log 02/04/14 15:33:56 932
View
Close

The important files are (this is not an exhaustive list):

bmr_status.log - restored disk and registry configuration log, eg. disks/partitions created summary etc.

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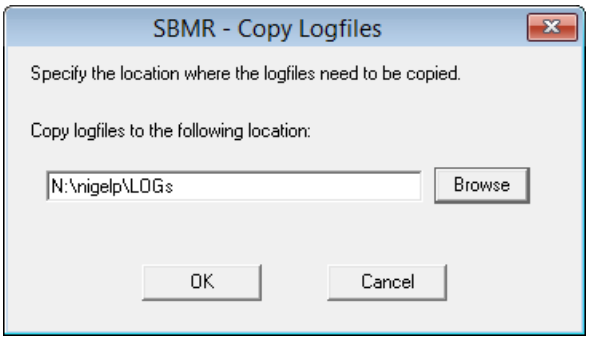
bmrcfg.log - contains a summary of the system configuration retrieval process.
bmrrest.log - contains a summary of the file retrieval process.
CCSC_dump.log - contains Simpana server/client summary information. Used by Cristie Support.
CCSC_trace.log - contains Simpana restore session information. Used by Cristie Support.
cdp_dump.log - contains general information regarding the system BIOS, disk configuration and timezone details of the original system.
cdp_trace.log - contains a detailed summary of how the partitions were restored. Used by Cristie Support for diagnosing disk configuration problems.
cds.log - Cristie deployment service log; used by Cristie Support to diagnose comms problems with other Cristie products, for example RecoveryConsole.**CGBC_trace.log** - Cristie Generic Backup Client log file.
CNM_trace.log - contains network library information. Used by Cristie Support.
crm_trace.log - contains a summary the Cristie Recovery Manager processing. Used by Cristie Support.
CRMWizard_trace.log - contains the Recovery Manager log. Used by Cristie Support.
CRO_trace.log - contains registry information. Used by Cristie Support.
dhw_log.log - contains a summary of Dissimilar Hardware Wizard activities. Used by Cristie Support for diagnosing new driver problems.
network.log - contains NIC hardware summary, current network configuration (eg. IP address, gateway IP address etc) and routing table.
PENetCfg_trace.log - contains trace for Cristie Network Configurator program usage.
RecoveryAgentService.log - Recovery Agent service log; used by Cristie Support to diagnose comms problems with other Cristie products, for example RecoveryConsole.
setupapi.log - contains a summary of the Plug and Play devices detected by WinPE 5 as it boots. Used by Cristie Support for diagnosing WinPE 5 driver problems.
soap.log - CDS interface.log. Used by Cristie Support.
Version.log - Used by Cristie Support to determine version of Cristie CBMR software and DLLs deployed.

7.2.6 Copy log files to removable media or network location

Since all log and error files generated during the recovery are only transitory (ie. they are lost as soon as the Windows WinPE 5 environment exits), this option allows you to copy the files to a local device or remote network share for permanent record before booting the recovered system.

Use the **Cristie Network Configurator** utility to setup a network share first. All the files are compressed into a single ZIP file so that they can be easily sent to Cristie Support when required.



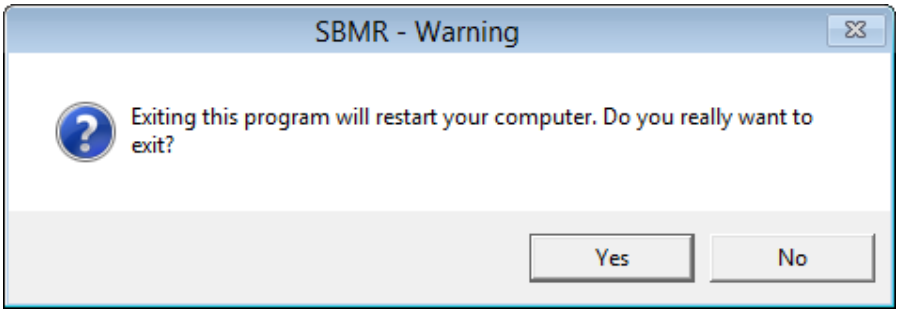
The example shows files being copied to a network share **A:**.

> ***Note: the logs are automatically written back to the recovered system after a successful recovery. They are saved to the SBMR installation sub-folder 'Temp'.***

7.2.7 Reboot

After a successful recovery, select **Reboot** to exit the Windows WinPE 5 environment and boot the recovered system.

Press Yes on the confirmation warning to restart or No to continue running the DR console. If you choose to reboot, the recovered Windows system will boot into the OS:



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8 Appendices

8.1 Windows 8/8.1 Storage Space and 2012/2012R2 Storage Pool Support

On Windows 2012, Windows 2012 R2, Windows 8 and Windows 8.1 based systems that are utilising the Storage Pool/Space feature, SBMR will support the backup of the Storage Pool/Space in a passive manner.

This is achieved by storing all the data contained on the Storage Pool/Space as a single volume, that will then be stored in the backup location, during the process of performing your backup. The actual physical construction of the storage pool/space will not be retained in this process.

The process required to protect the data contained on a Storage Pool/Space will typically consist of the following steps:

1. Create a SBMR backup of the system. (This consists of the local partitions, storage pools and the System State)

2. Recover the backup using the SBMR recovery media, choosing just to recover just the Operating System and associated System State.

3. Reboot the recovered system.

> ***Note: When recovering to the original machine, the Storage Pool/Space should still be available. This enables step 4 below to be skipped.***

4. Open Server Manager (Windows 2012/2012 R2) or Control Panel (Windows 8/8.1) and create a Storage Pool/Space. (This does not need to be a replica of the original Storage Pool/Space).

5. Launch CommVault Simpana and recover the data from the backup location to an available Storage Pool/Space.

8.2 uEFI and MBR BIOS support

> ***Note: No support is provided for conversion from uEFI to MBR BIOS or from MBR BIOS to uEFI.***

The recovery ISO is not uEFI enabled. Therefore a successful recovery requires a uEFI environment capable of booting the recovery ISO in MBR BIOS.

Physical machines

There are no special considerations that need to be made by the customer for physical uEFI machines.

All Cristie Bare Metal Recovery software handles the recreation of the uEFI and MSR partitions during the recovery of the physical machine, this is transparent to the user. When recovering a uEFI enabled OS you must recover to uEFI capable hardware.

Virtual machines

> ***Important note: When using virtualisation software check the virtualisation software documentation to determine if uEFI is supported.***

To recover to uEFI take the following steps:

1. Once you have a “Recovery Success” message from the SBMR recovery, click Reboot, and then shutdown the recovered VM.

2. Edit the Options of the Virtual Machine, and change the BIOS to be uEFI (instead of the standard MBR BIOS).

3. Once the BIOS has been changed, you will need to boot the VM into the uEFI BIOS using the VM boot options.

4. When recovery is to a different machine, you may need to configure the uEFI boot Stanza in order to boot the recovered uEFI OS. Please refer to the Cristie Knowledgebase for further information on editing the boot Stanza. This consideration applies to Physical and Virtual recoveries.

Once the above steps have been performed, your recovered uEFI OS will boot in your virtualisation software.

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9 Cristie Technical Support

If you have any queries or problems concerning your Bare Machine Recovery for CommVault Simpana product, please contact **Cristie Technical Support**. To assist us in helping with your enquiry, make sure you have the following information available for the person dealing with your call:

- SBMR Version Number
- Installed OS type and version
- Any error message information (if appropriate)
- Description of when the error occurs
- All Cristie log files relating to the source or recovery machine. This is very important to help us provide a quick diagnosis of your problem

Contact Numbers - Cristie Software (UK) Limited

Technical Support	+44 (0) 1453 847 009
Toll-Free US Number	1-866-TEC-CBMR (1-866-832-2267)
Knowledgebase	kb.cristie.com
Sales Enquiries	sales@cristie.com
Email	support@cristie.com
Web	www.cristie.com

Support Hours

05:00 to 17:00 Eastern Standard Time (EST) Monday to Friday

Out-of-Hours support available to customers with a valid Support Agreement - Severity 1 issues* only

UK Bank Holidays** classed as Out-of-Hours - Severity 1 issues only.

*Severity 1 issues are defined as: a production server failure, cannot perform recovery or actual loss of data occurring.
**For details on dates of UK Bank Holidays, please see www.cristie.com/support/

Cristie Software Limited are continually expanding their product range in line with the latest technologies. Please contact the Cristie Sales Office for the latest product range. Should you have specific requirements for data storage and backup devices, then Cristie's product specialists can provide expert advice for a solution to suit your needs.